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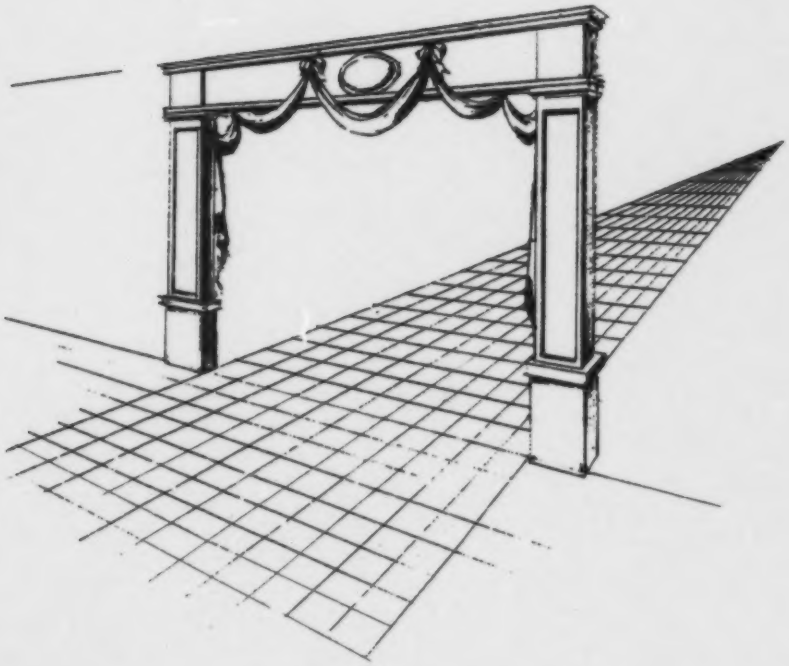
Safety Guidelines for the Live Performance Industry in Ontario

3rd Edition - August 2005



Health and Safety Guidelines

For more copies, please contact:

Publications Section
Ministry of Labour
655 Bay St, 14th Fl
Toronto ON M7A 1T7

Tel: 416-326-7731 / 800-268-8013
Fax: 416-326-7745
E-mail: mol.publications@mol.gov.on.ca
Website: www.labour.gov.on.ca

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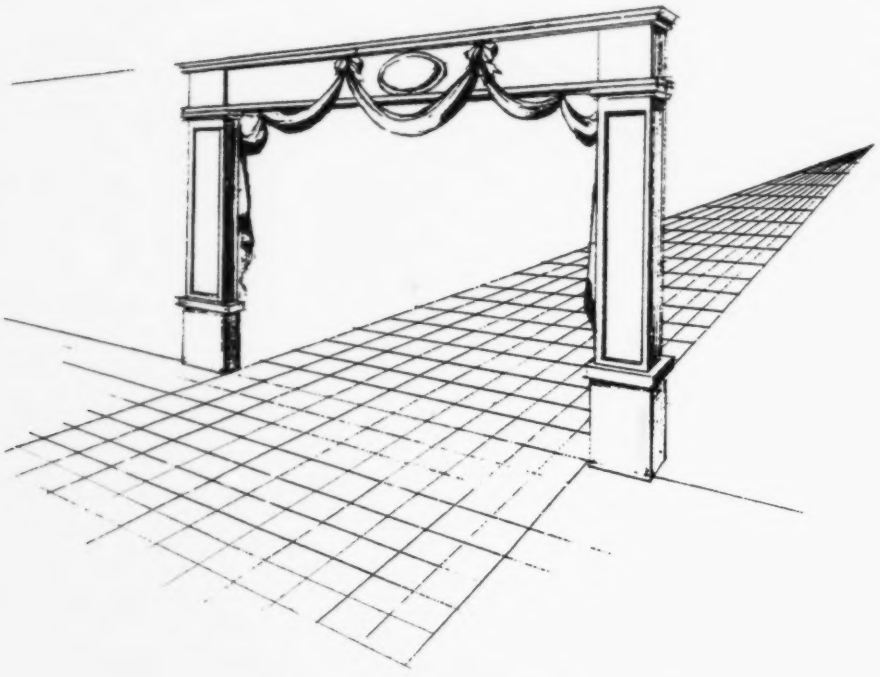

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INTRODUCTION

The Safety Guidelines for the Live Performance Industry in Ontario (the Guidelines) grew out of a need to address health and safety problems that are unique to our business.

The *Occupational Health and Safety Act* (the Act) is the primary source for the issues and information in this document. Each employer/engager, supervisor and working professional ("worker") needs to be familiar with the provisions of the Act and the regulations that apply to live performance work environments. All of these workplace parties have responsibilities under the Act and the regulations. It is important to note that the Act considers all self-employed independent contractors to be "workers".

In the context of live performance workplaces, inspectors with the Ministry of Labour will apply the requirements of the *Occupational Health and Safety Act* and the relevant regulations made under the Act such as Regulations for Industrial Establishments, Workplace Hazardous Materials Information System (WHMIS) Regulation, and Regulations for Construction Projects. Ministry inspectors will also be made aware of these Guidelines, but **it is important to remember that their responsibility is to apply and enforce the law and they are not bound by or obliged to apply the Guidelines.**

These Guidelines have been prepared by representatives of the industry on the Health and Safety Advisory Committee for Live Performance to assist employers/engagers, supervisors and working professionals in meeting the requirements under the Act and the relevant regulations made under the Act. The Committee was assisted by experts in the various skills, hazards and techniques mentioned throughout this document (see Acknowledgements, page 71).

The Guidelines recommend realistic procedures to develop methods for identifying potential hazards in our work environments, in order to increase our productivity and to protect those working in the live performance industry. Safe procedures do not involve losing the *appearance* of risk that can be such a vital quality of onstage live performance. These Guidelines are intended to assist people involved in the industry and not replace the laws that are in place. To determine their legal workplace duties and rights, employers/engagers, supervisors and working professionals are urged to refer to the actual legislation. The Guidelines will be continually updated and augmented, to deal with the changes in the live performance field as they occur.

The Guidelines are for everyone in the live performance field. They aim to educate every live performance worker, in all disciplines, at all levels, in the value of hazard recognition and safe working practices. Education is the foundation of any health and safety program, with knowledgeable performers, support staff, and management working together. The more workers and management know, the more effectively they can identify specific needs and issues before those issues become problems.

Safe practice in a safe environment makes for an efficient operation. At all times we must be vigilant in identifying potential hazards by being aware of where we are, what we are doing, with what and to whom. Safety is cost effective in both human and economic terms.

HAZARD RECOGNITION, ASSESSMENT AND CONTROL

Live performance venues and production environments (shops) can be dangerous places. They contain a vast assortment of equipment, tools, chemicals, and people, which together create the play, musical, dance, or opera. Those same components can also create numerous hazards, some with the potential of causing permanent personal injury. Hazard recognition, assessment and control are key to reducing and eliminating real and potential hazards. Everything we do has potential hazards, and everyone we work with is a partner in hazard recognition or a potential victim in occurrences. These Health and Safety Guidelines help you avoid many occurrences and reduce the damage and injury from occurrences that do occur.

The facts:

* Occurrences, damage and injury are caused.
* Occurrences, damage and injury can be prevented if the causes are eliminated.
* Causes can be eliminated if we investigate all occurrences and potential occurrences properly, and implement solutions.
* Unless the causes are eliminated, the same occurrences will happen again.

WORK SAFELY. THINK BROADLY.

Awareness must be constant. Together with our knowledge and skills, we must support and appreciate the less tangible human abilities like imagination and intuition in hazard recognition. Beyond the Act and beyond the Guidelines come good judgement, practical knowledge and common sense.

SPEAK UP. TAKE ACTION.

Everyone working in live performance, on stages, and in shops must be involved in hazard recognition and control. We must not assume that hazards are other people's responsibility. We must all speak up and take action when we know or believe there are hazards in our workplace. We must also encourage others to speak up, and encourage and support them when they do. There should be no fear of retribution for speaking up about hazards. To be silent and take no action has potentially greater dangers.

DEFINITIONS

Hazard: any circumstance, condition, or combination that poses the risk of an injury.

Occurrence: any unplanned and unwanted event that may result in damage or injury.

Performance: includes onstage, backstage, orchestra pit, fly gallery, trap rooms, quick change areas, dressing rooms, cross-over corridors, voms, entrances and booths.

Rehearsal Hall: the area where the creation of onstage activities with performers, directors, stage managers, choreographers and others occurs.

Production Period: the span of time from the point at which the production is conceived until the production is completed.

Production Area (shop): any space where the creation of goods used in live performance occurs. This includes all shops for props, scenery, costumes, lighting, sound, wigs, make-up, special effects, etc.

Minor Injury: can be treated with first aid.

Major Injury: requires off-site medical treatment and can result in lost time, loss of limb(s) or permanent disability.

Critical Injury: is defined in Regulation 834, and means an injury of a serious nature that,

a) places life in jeopardy,
b) produces unconsciousness,
c) results in substantial loss of blood,
d) involves the fracture of a leg or arm, but not a finger or toe,
e) involves the amputation of a leg, arm, hand or foot, but not a finger or toe,
f) consists of burns to a major portion of the body, or
g) causes the loss of sight in an eye.

Standard Industry Practice: describes the work that is done and the conditions under which workers normally carry out their occupation.

Workplace: includes all areas involved in a live performance or rehearsal, and all areas of production used to create those products necessary for a live performance or rehearsal.

Some information to help you use these guidelines more effectively:

1. **Shall** is used when referring to a practice that is law. **Should** is used when referring to a practice we recommend.

2. For a definition of "competent" person, please refer to the *Occupational Health and Safety Act*.

GENERAL INFORMATION

1. Where applicable, workers in a live performance workplace shall select a safety representative from within the group. If the workers are represented by a union, the union has a responsibility to select a health and safety representative. (See Sections 8 and 9 in the Act for further information.)

2. Each workplace shall have a copy of the Act, the Regulations and the Safety Guidelines for Live Performance easily accessible for workers and management.

3. All workplaces shall follow the first aid requirements made under the *Workplace Safety and Insurance Act.*

4. Fire regulations and WHMIS requirements shall be strictly observed. Anyone performing activities or using materials covered by these regulations must ensure that personnel likely to be affected are fully informed of all hazards.

GENERAL RECOMMENDATIONS

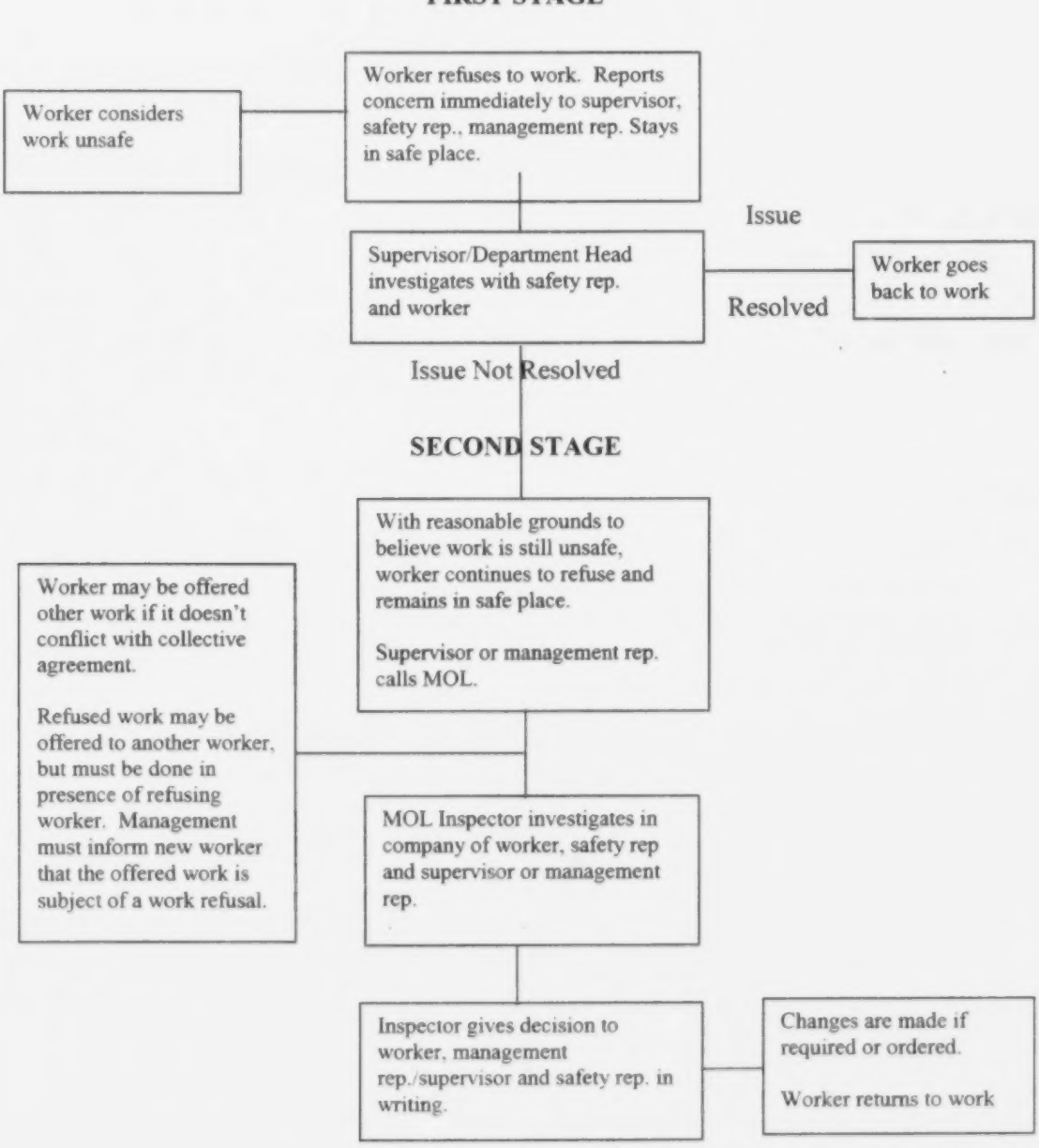
1. Where a permanent health and safety committee exists in a live performance location, any incoming group of workers should select a safety representative from within the group.

2. All workplaces should have a health and safety notice board to warn all personnel of any hazardous procedure, to refer to the relevant health and safety guidelines, and to give the location of safety and first aid equipment. Where a call sheet is used, it should incorporate the day's health and safety information.

3. Communication is essential. Before the rehearsal of any potentially hazardous sequence, there should be a meeting of all relevant personnel for a thorough briefing. If substantial changes become necessary later on, another meeting should be held for all personnel involved, to confirm everyone's understanding of and agreement to the changes.

PROCEDURE FOR A WORK REFUSAL

You don't have to do or use anything you consider unsafe. Any worker who thinks that a piece of equipment or an activity is hazardous may refuse to use that equipment or do that activity. You do not have to make a formal or official announcement. Simply stating that something is unsafe is enough to start the work refusal process.


FIRST STAGE
Worker considers work unsafe
Worker refuses to work. Reports concern immediately to supervisor, safety rep., management rep. Stays in safe place.
Issue
Supervisor/Department Head investigates with safety rep. and worker
Worker goes back to work
Resolved
Issue Not Resolved
SECOND STAGE
With reasonable grounds to believe work is still unsafe, worker continues to refuse and remains in safe place.
Supervisor or management rep. calls MOL.
Worker may be offered other work if it doesn't conflict with collective agreement.
Refused work may be offered to another worker, but must be done in presence of refusing worker. Management must inform new worker that the offered work is subject of a work refusal.
MOL Inspector investigates in company of worker, safety rep and supervisor or management rep.
Inspector gives decision to worker, management rep./supervisor and safety rep. in writing.
Changes are made if required or ordered.
Worker returns to work

HAND PROPS AND COSTUMES

This guideline deals with the use and handling of props and costumes during rehearsal and performance.

DEFINITIONS

Hand prop. Any article that is carried or handled, not worn, by the performer.

Costume. Any article, including footwear, masks, wigs and headgear, that is worn, not carried or handled, by the performer.

Flame retardant. A chemical used to provide flame resistance.

Flame resistant. (Adjective) See **flame resistance**.

Flame resistance. The property of a material whereby flaming combustion is prevented, terminated, or inhibited following the application of a flaming or non-flaming source of ignition, with or without subsequent removal of the ignition source.

GENERAL GUIDELINES

1. The safety of performers and others who handle props and costumes should be taken into account in all stages of their design, purchase, construction, repair, maintenance and use. Consideration should be given to the safe integration of hand props and costumes with the other elements of the production, including but not limited to scenery, lighting, sound and performance venue.

2. The age, size and physical fitness of the performers should be taken into account in all stages of design, purchase, construction and use of hand props and costumes.

3. The responsibility for the construction, care and maintenance of individual items should be clearly assigned by the producing company.

4. Items constructed for a production should be accompanied by the maker's instructions for care and maintenance.

5. Props and costumes should be checked regularly for wear or damage and repaired or replaced when necessary.

6. Performers should inform the person(s) responsible as soon as possible of any repairs needed to maintain the safety of a costume or prop.

7. Performers should be given adequate instruction and rehearsal time to become accustomed to all props and costumes as they will be used in performance, including scene changes and costume quick changes.

8. The company should ask performers if they have any allergies to food, or props and costume materials.

9. Performers should inform the company as soon as possible about any allergies or adverse physical reactions to props and costume materials.

10. Paints, dyes, adhesives and solvents used in construction, repair and maintenance should be allowed to evaporate completely before the costume or prop is used.

11. Solvents used in cleaning should be allowed to evaporate and the article should be aired sufficiently before use.

12. Those portions of props or costumes which are likely to come in contact with the performer should be free of materials or finishes which could cause injury or harm.

13. Performers should be provided with assistance in cases where the combination of costume, props, scenery and/or lighting creates safety concerns.

HAND PROPS GUIDELINES

1. Hand props should be designed, chosen and built with consideration for their specific use on stage.

2. Props should be checked for rough edges, chips, loose material or other potential hazards before being given to the performers.

3. Rehearsal props should be provided wherever practicable and should be as close as possible in size, weight and shape to the intended performance articles.

4. Performers should be informed of any changes made to a hand prop already in use and be given adequate time to work with the changed article.

5. Any addition or change in stage business that involves the use of hand props should be rehearsed with the props before it is included in the performance.

6. Alternatives to open flame should be considered wherever possible. Where open flame is used, items placed or used near open flame should be made of flame resistant materials or treated with flame retardant.

COSTUMES GUIDELINES

1. Within the reasonable bounds of period, style and character, costumes should be designed, constructed and fit so as not to impede movement unnecessarily on or off stage.

2. The person(s) responsible for costumes should be informed as soon as possible about special movement required of a performer so that these movements may be anticipated in the construction and fit of the costume.

3. Rehearsal costumes should be provided wherever practicable and should be as close as possible in size, weight and shape to the intended performance articles.

4. All aspects of costumes should be fitted to avoid injury or unnecessary discomfort. Costumes, including masks, wigs and headgear,

    a. should provide a field of vision adequate for safe movement on and off stage;
    b. should not obstruct the performer's breathing or hearing;
    c. should be fitted and balanced to prevent headaches, neck or back strain;

5. During fittings, performers should be encouraged to consider their anticipated range of staged movement in each costume.

6. The combination of performer footwear and playing surface should provide the degree of traction necessary for the safe execution of the performance.

7. Alternatives to open flame should be considered wherever possible. Where open flame is used, costumes worn near the flame should be made of flame resistant materials or be treated with flame retardant. Any trim or decoration applied to the costume after treatment with flame retardant should also be made of flame resistant materials or be treated with fire retardant.

8. Costumes worn next to the skin should be cleaned/washed frequently. Other costume elements, including wigs, masks and headgear, should be cleaned/washed as necessary.

ORCHESTRA PITS

The orchestra pit, by its very nature, is the equivalent of a large, open stage trap and is a constant risk to the safety of stage performers, musicians and stage personnel. Any guideline for pit safety should begin with the reminder that all theatre workers should be responsible for each others' safety - particularly directors when blocking their actors in a production, and stage performers when handling properties and loose items on stage out of sight of the pit musicians. Common sense should prevail at all times in the pit.

DEFINITIONS

Contractor. (Personnel Manager) The person responsible for hiring the orchestra musicians.

Leader. (Music Director, Conductor) The person responsible for the musical performance of the orchestra.

Orchestra Pit. An area immediately downstage of the lip of the stage and sometimes partially beneath the stage, separated from the audience by a pit well and rail, and in which musicians' heads are below the surface of the stage when the musicians are seated for performance.

Alternative Orchestra Area. Any area other than the orchestra pit in which musicians are seated for performance.

GENERAL GUIDELINES

1. The contractor or leader should be responsible for making a pit plan available to the person in charge of the pit in sufficient time for the set-up and maintenance of the pit.

2. In cases where it is architecturally impossible to install an orchestra pit cover and where an alternative orchestra area is used, all due care should be taken by the management of the venue to protect the members of the orchestra.

PIT COVERS

1. The management of a venue that has an orchestra pit should be responsible for providing a pit safety cover to prevent accidental falls by personnel into the pit, and to catch material which, when accidentally dropped from the stage, could cause injury.

2. When the pit is occupied, the pit safety cover should be in place. At all other times the pit cover should be in place or a warning barrier should be placed at waist level, sufficiently upstage of the pit to prevent people from falling in.

3. An orchestra pit safety cover should:

   - be able to support the weight of a human body falling from the stage or any raised performance area;
   - be flameproof;
   - not interfere with the proper ventilation of the orchestra pit;
   - allow adequate line of sight between conductor and musicians and between conductor and performers;
   - conform to the shape of the pit opening. As the size and shape of each orchestra pit is different, a safety pit cover requires custom fabrication and installation. If a given production uses scenic elements that extend into the pit area, the pit cover may need to be re-configured or replaced.

4. The pit safety cover should extend across the entire width of the pit and a sufficient distance over the orchestra pit from the lip of the stage to prevent accidental falls by personnel into the pit and to catch material which, when accidentally dropped from the stage, could cause injury.

5. The shape and size of the opening in the pit cover for the conductor should allow the conductor to conduct without impediment while not unduly compromising the safety of the musicians.

6. The pit cover should be an acoustically transparent flameproof net or grid. The net should be of a size and strength appropriate for the impact it may sustain during the production.

7. A flameproof theatrical gauze or scrim may be stretched over the orchestra pit cover to prevent smaller lightweight objects from falling into the pit. Care should be taken to allow proper ventilation of the orchestra pit if a gauze is used.

RISERS/CHAIR RAILS ON RISERS

1. Each riser on which seated musicians are required to play should be provided with chair rails of sufficient strength and height to prevent chairs or music stands from sliding off the edge of the riser.

2. The edges of all risers should be adequately marked.

3. Access points to the risers should be adequately marked.

SOUND LEVELS

1. In the section on sound levels (page 22), the General Guidelines set forth recommended limits of impulse and steady state sound pressure levels, above which hearing conservation programs should be implemented. The Sound Level Reduction Guidelines outline several strategies which used singly, or in combination, are likely to provide a significant reduction in sound pressure levels received at the ear of the affected worker.

   It is recommended that where workers and management are jointly engaged in efforts to reduce the effect of possible short- and long-term auditory damage to musicians performing in orchestra pits, reference be made to the Sound Levels Guidelines contained in the *Safety Guidelines*. It is hoped that these guidelines will help to obtain an acceptable sound environment without interfering with the artistic integrity of the production.

LIGHTING

1. Adequate lighting should be provided both before and after performance to allow safe movement in and out of the pit.

2. Music stand lighting sufficient to prevent eye strain should be provided during the performance.

3. All music stand light levels and changes to levels, including dimming, blackouts and restoration, should be set and rehearsed before the first performance.

WIRING ON FLOOR

Electrical Wiring:

1. A pit plan showing seating, risers and stand placement should be given to the person responsible for the pit set-up in sufficient time to allow the pit to be wired safely with enough circuits for all the stands and other electrical requirements before the first rehearsal.

2. Adequate power should be provided for all stand lighting and any other electrical requirements.

3. If changes to the pit plan are required, sufficient notice should be given to the person responsible for the pit set-up.

4. All cables in the pit should be of adequate length and be taped down after the set-up is complete. No cable should be stretched to reach the plug-in box.

5. Re-plugging in the pit should be done only by a competent person.

6. All cables should be positioned so as not to impede the normal traffic patterns in the pit.

Audio Wiring:

1. Placement of microphones should allow for adequate room for instrument performance and should not impede the traffic patterns in the pit.

2. The placement of cables should follow the same recommendations as those for electrical wiring, and should be done only by competent persons.

HOUSEKEEPING/FLOOR HAZARDS/FIRE HAZARDS

1. Management should be responsible for general cleaning of the pit on a regular basis.

2. Each pit musician should be responsible for the removal of all personal items and garbage daily.

3. Instruments and cases should not be left where they interfere with safe access to and cleaning of the pit.

4. Garbage receptacles should be reasonably accessible to each pit area.

5. Open containers of water for reeds or beverages are a potential electrical hazard. Only covered containers should be brought into the pit.

6. The pit should be vacated during any major re-organization of the pit set-up.

7. At least two all-purpose fire extinguishers should be strategically placed in the orchestra pit.

8. All ceiling obstruction (sprinkler heads, light fixtures, pit cameras) should be protected and well-marked.

9. Personnel in the pit should be protected from any pyrotechnical debris.

VENTILATION AND AIR CONDITIONING

1. An orchestra pit is a workplace that, in accordance with section 127 of Regulation 851 ("Industrial Establishments"), R.R.O. 1990, "shall be adequately ventilated by either natural or mechanical means such that the atmosphere does not endanger the health and safety of workers".

2. The ventilation in an orchestra pit, in accordance with section 128 of that regulation, shall:

- replace the air exhausted;
- be free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas;
- not blow settled dust into the pit;
- not interfere with any exhaust system;
- not cause any undue drafts;
- prevent the return of exhausted air containing contaminants.

3. An orchestra pit is a workplace that, in accordance with section 129, shall be maintained at a "temperature suitable for the type of work performed", and shall be at a temperature "not less than 18° Celsius".

PERFORMANCE SPACE/ERGONOMIC FACTORS

1. Lack of sufficient space in which to play an instrument may cause repetitive motion strain or injury. A pit plan that gives adequate performance space for each musician should be provided by the contractor. Any problems with the pit set-up should be communicated to the contractor or the leader.

2. Proper seating for each performing musician should be provided in the form of a well-maintained chair of medium to low height with a flat back and a level seat.

PERFORMER FLYING AND AERIAL STUNTS

During performer flying and aerial stunts there is a much greater chance of injury in the event of an accident than during normal performance activities.

There are many different types of performer flying and aerial stunts. Most of them can be rigged in a variety of ways. This document will not deal with the specific technical details of the various types of rigging. Instead, it will provide general guidelines for the principles of safe design, rigging and performance.

"Competent person" is defined in subsection 1(1) of the *Occupational Health and Safety Act.* With regard to performer flying and aerial stunts, this means that all parties involved must have the knowledge and training (through adequate rehearsal) to operate and perform the effect safely. It also means that they must be aware of any possible danger involved in operating or executing the effect.

DEFINITIONS

Performer flying. The operator-controlled raising or lowering of a performer who is suspended by line, rope or cable, where the performer has little or no control over the speed or direction of travel.

Aerial stunts. Manoeuvres or tricks assisted by line, rope or cable, where the performer has control over the speed or direction of travel.

Aerial arena. Any space through which a suspended performer travels. Also called **fly area.**

Drop zone. The space directly above or below the point at which the performer is initially suspended or lifted.

Effect. Any performer flying or aerial stunt.

Hands-off catch. Any failsafe system used to prevent an accidental fall in the event of operator or performer error. (So called because it is designed to prevent a fall even if the operator or performer were to take both hands off the line.)

Load-in point. The area where the performer hooks up to the flying system.

Operator. A competent person responsible for running the equipment.

Passive secondary. A back-up component of a rigging system that only takes weight if the load-bearing component fails. Also called a redundancy system.

Rigger. A competent person responsible for the installation and maintenance of the flying equipment. May also be a **stunt co-ordinator** or **operator**.

Stunt co-ordinator. A competent person responsible for co-ordinating and staging all stunts. May also be a **rigger** or **operator**.

AREAS OF RESPONSIBILITY GUIDELINES

There should be a competent person responsible for the following aspects of the effect:

1. Design: planning the system that makes the effect possible.

2. Construction, assembly and rigging: putting together the necessary equipment, installing and inspecting it before its first use.

3. Operation: running the equipment that makes the effect possible.

4. Maintenance: inspecting and testing the equipment throughout its use to ensure that it continues to operate safely.

5. Rehearsal: determining that the effect has been sufficiently rehearsed to be performed safely.

6. Pre-performance check: determining, before each performance of the effect, whether it is still safe to be performed.

7. Performance: performing the effect.

8. Communication: ensuring that everyone involved in the effect will be kept up to date with all relevant information.

All parties involved in performer flying or aerial stunts should know who is responsible for each aspect of the effect.

TRAINING AND REHEARSAL GUIDELINES

1. The operator or performer should be given adequate training and rehearsal time with a rigger or stunt co-ordinator.

2. All aerial stunts and flying systems should have an assigned rigger or stunt co-ordinator. If the assigned rigger or stunt co-ordinator is not part of the running crew or cast, a person should be trained to carry out pre-performance maintenance and inspection of all flying systems and equipment and to call for any necessary stunt or fly warm-up before the performance.

3. If understudies or back-up operators are used, they should have full training and rehearsal by the stunt co-ordinator or rigger equal to that of the person they are replacing.

EQUIPMENT GUIDELINES

1. Equipment used (ropes, lines, cables, harnesses and hardware) should be designed to support the weight of the performer comfortably and to bear live loads. The equipment should be manufactured for that purpose or be of an equivalent standard. The rigger or stunt co-ordinator should approve the use of all equipment.

2. Equipment should be rated at a minimum breaking strength to load ratio of 10 to 1.

3. All flying systems, equipment, knots and other tie-offs should be checked for wear, damage and integrity before every performance.

4. A retirement schedule for the replacement of equipment should be established by the rigger or stunt co-ordinator. The rigger or stunt co-ordinator determines which equipment, if any, needs such a schedule.

SYSTEMS GUIDELINES

1. There should be clear access to the load-in point for the performer and operator.

2. When the operator is unable to hook up the performer, a competent person should be assigned to do so.

3. There should be sufficient visibility to hook up, check and operate the flying systems properly.

4. The drop zone, fly area (aerial arena) and landing point should be clear of obstruction according to the instructions of the rigger or stunt co-ordinator.

5. A hands-off catch should be incorporated into the rigging system. The system should include a method of safe retrieval of the performer or operator should the hands-off catch be used.

6. A safe communication system between the performer, operator and ground crew should be agreed upon.

7. The operator should be in a position that is secure and free from distraction.

8. Components such as webbing, rope or cable, which are susceptible to wear due to abrasion, should be backed up with a passive secondary. The passive secondary deployment should be checked during pre-performance inspection.

9. Static or fixed lines intended for active loads such as swinging or climbing should not be tied off directly to abrasive structures such as angle beams, which may damage or weaken the primary lines. Passive secondaries should be used when tying off load-bearing lines or ropes.

10. Passive secondaries should be installed in positions that will minimize the shock load if any load-bearing point fails.

NOTE: Section 2 of the Regulations permits alternative, equivalent arrangements. With regard to performer flying and aerial stunts, this means that one type of equipment or action may be substituted for another, so long as the safety of all parties involved in the effect is at least as great as it would be without the substitution.

NOTE: The Foy System and similar flying systems do not usually use hands-off catches and passive secondaries, which these guidelines recommend. However, Foy is generally accepted as one of the standard systems in the industry.

PYROTECHNIC SPECIAL EFFECTS

Theatrical pyrotechnics are governed under the Federal Department of Energy, Mines and Resources Explosives Division Class 7.2.5. The federal regulations are currently being rewritten to reflect their use more accurately.

These guidelines have been adapted from the Ontario Film and Television Industry Section 21 Guidelines, the National Fire Prevention Association Code 1126 (Standard for the Use of Pyrotechnics), the California Film Industry Fire/Life Safety Handbook and the Alberta Section of Canadian Institute of Theatre Technology, Pyro Standards.

Any person who assumes the responsibility for pyrotechnics must have a clear understanding and working knowledge of the guidelines of the NFPA Code 1126 and of the Department of Energy, Mines and Resources Explosives Division.

DEFINITIONS

Pyrotechnic special effect. An effect where a chemical mixture is used to produce visible or audible effects by combustion, deflagration or detonation.

Pyrotechnician. The person who is responsible for pyrotechnic safety, who controls, initiates, or otherwise creates special effects, and who is responsible for the storing, setting up and removing of pyrotechnic materials for the production.

Blocking. The process by which the director moves the performers around the stage. A person (generally the stage manager) notes these movements in the prompt script in order to track all of the performers' movements during the show.

Deflagration. A rapid chemical reaction in which the output of heat is sufficient to enable the reaction to proceed and be accelerated without input of heat from another source. The effect of deflagration under confinement is an explosion.

Detonation. An extremely rapid chemical reaction in which the pressure generated is sufficient to cause the formation of a shock wave, which acts to cause the reaction to proceed. The effect of detonation without confinement is an explosion.

Dry run. A rehearsal to demonstrate an effect to all performers, crew and anyone else involved.

GENERAL GUIDELINES

1. No child performer should be exposed to pyrotechnical effects unless written permission is received from a parent or guardian prior to rehearsal/performance.

2. "No Smoking" and "Explosive" signs shall be posted where pyrotechnics are stored and handled.

3. Handling, storage and preparation of pyrotechnic materials shall be in compliance with federal, provincial and local codes, and be within the manufacturer's guidelines.

4. No smoking shall be allowed where pyrotechnical devices are used.

   NOTE: Smoking may be allowed in performance as blocked in rehearsal and if approved by the pyrotechnician and the authority having jurisdiction.

5. The transporting of pyrotechnical devices and materials shall be done in compliance with all applicable federal, provincial and local laws. Class 7.2.5 Explosives are covered under the *Transportation of Dangerous Goods Act*.

6. Sufficient number of the appropriate fire extinguishers shall be located within a reasonable distance of all pyrotechnic materials being loaded, prepared for firing and fired. The number shall be determined by the authority having jurisdiction.

PERFORMANCE GUIDELINES

1. Whenever pyrotechnic special effects are to be used in a production, a pyrotechnician should be employed before the first rehearsal.

2. The pyrotechnician should ensure that the authority having jurisdiction (generally the fire department or a Department of Energy, Mines and Resources representative) has been notified of the use of pyrotechnics for the production.

3. Before the rehearsal/performance, all personnel involved with the production should be notified that pyro effects are to be employed. This notice should also appear in writing on the daily call sheet for rehearsals where pyrotechnics are used. The nature of the effects should be specified in the daily call sheet.

4. Before involving performers for the first time,

   - a dry run of the effects must take place on site to demonstrate timing, spacing and safety parameters;
   - safety equipment and safety precautions such as fire extinguishers, warning and communication systems should be in place;
   - the intended action, possible deviations and the authority to abort should be made clear;
   - all performers and support personnel should be warned of exposure to a hazard when performing or otherwise carrying out their responsibilities in the vicinity of a pyrotechnic special effect;
   - the dry run should take place in an environment as free of distractions as possible.

5. Before any pyrotechnical sequence is performed for the first time, a technical rehearsal should be called.

6. In addition to the normal blocking notes kept by the stage manager, blocking for the pyrotechnical effects should be put in writing by the pyrotechnician and distributed to all involved departments and individuals.

7. The pyrotechnician should have the final authority to abort any effect.

8. The pyrotechnician should be in attendance whenever a pyrotechnical effect is executed in rehearsal or performance.

9. The stage manager or pyrotechnician should make clear to everyone involved in the production the location of exits and escape routes. The escape must provide unobstructed passage to the exterior of the building, structure or workspace.

10. Whenever possible, only those performers and crew necessary for the success of the effect should be in close proximity to the effect. Other performers should remain at a safe distance (to be determined by the pyrotechnician).

11. Immediately before any performance the pyrotechnician should make a final check of wiring, position, hookups and pyrotechnic devices to ensure that all are in proper working order. Adequate time should be allowed for this check.

12. The pyrotechnician should have an unimpeded view of the effect. Where this is not possible, an assistant, who is in direct communication with the pyrotechnician and has an unimpeded view of the effect, should be assigned. The assistant should be familiar with the effect and the conditions that would qualify for aborting it.

13. Immediately after each performance the pyrotechnician should verify that all pyrotechnic devices have fired. Any unfired pyrotechnic materials or devices should either be fired or disposed of in accordance with the manufacturer's instructions.

14. If, at any time, substantial changes become necessary for the success of the pyrotechnical effect, a meeting should be called by the pyrotechnician to confirm everyone's understanding of and agreement to the change(s). All changes (location, quantity, spacing) should be noted on the blocking plan and distributed to all involved departments and individuals.

15. The pyrotechnician may have one or more designated assistants who take on the responsibilities during the pyrotechnician's absence. The pyrotechnician should ensure that the assistant(s) has the proper knowledge and training in order to comply with the pyrotechnician's scope of work. In the event of the pyrotechnician's departure from the production, the responsibilities of the pyrotechnician will transfer to an assistant.

    NOTE: Examples of assistants are stage manager, assistant electrician or anyone who demonstrates the knowledge required of the pyrotechnician as defined.

RIGGING SYSTEMS AND FALL ARREST

DEFINITIONS

Counterweight system. A type of rigging system using steel cables, blocks (possibly), a pipe batten, and counter-balanced weights placed in an arbor.

Flown scenery. Scenery shifted by raising or lowering it vertically over the acting area by rope-line rigging or a counterweight system.

Fouling. Unintentionally entangling scenery, flown lights, drops, borders, etc.

Pick-up points. The points where ropes are attached to theatrical equipment to fly it.

Pocket. A tube sewn into the bottom of a soft flown scenic unit, into which chain or pipe is inserted to stretch or straighten the unit.

Rigging. All the activities involved in preparing theatrical equipment when it is first taken to the stage.

Rigging equipment. All the hardware, including the system itself, which is used to fly theatrical equipment.

Rigging system. The method for raising and lowering theatrical equipment vertically by means of blocks and ropes or steel cables; may include a batten.

Safetied. Having provided a secondary system of securing items that are stored overhead.

Scenic unit. An individual piece or assembly of scenery used onstage.

Turn-buckle. A hardware device for closely adjusting the length of a rope or cable. Consists of opposing right- and left-handed screws so arranged that turning a centre element shortens or lengthens the cable.

OPERATION AND MAINTENANCE OF PERMANENT RIGGING SYSTEMS

1. The owner of rigging equipment should ensure that proper equipment is used as intended and within the designed safety factor. The owner should ensure that all equipment is properly operated and maintained by a competent person.

2. The methods and frequency of maintenance of a rigging system should be determined by the owner or by a contractor on behalf of the owner in accordance with:

    - the manufacturer's or his/her agent's recommendations for maintenance;

- the system's current condition;
- the frequency and method of use of the rigging system;
- the Regulations for Industrial Establishments under the *Occupational Health and Safety Act.*

3. The maintenance of a rigging system should include:

   - an inspection and examination by a competent person at least once a year of all parts and functions of the rigging system (Items that receive frequent use or considerable wear should be inspected more often.);
   - cleaning, lubricating and adjusting all parts of the rigging system at regular intervals, and repairing or replacing worn or defective components;
   - repairing or replacing damaged or broken parts.

4. The inspector should be satisfied that the rigging system is in a safe operating condition and that the parts and functions will remain in a safe operating condition until the next scheduled inspection and examination.

5. A permanent log of maintenance and inspections should be kept. All entries should be signed by the inspector and verified by the owner or designate.

6. Where a part of a rigging system is replaced for any reason, the replacement part should be at least equivalent to the original part as supplied by the manufacturer or as specified in the design submission.

7. The operator should have such knowledge of and experience in operating the rigging system that,

   - the operator is able to operate the rigging system safely without supervision;
   - the operator is aware of all likely hazards in using the rigging equipment.

TEMPORARY FLOWN SCENERY — HARD OR FRAMED

1. The construction of individual pieces of flown scenic units, and the assembly of the pieces into the unit(s), will be done by a competent person or approved by a supervisor.

2. In constructing pieces of hard or framed scenic units to be flown, all elements should be joined by gluing and screwing or bolting or welding or an equivalent permanent method of joinery.

3. In flown units, pieces that move and that may create fouling hazards or may change the balance of the unit in the air should be secured before the unit is flown.

4. The pins of hinges used in the assembly of flown units should be safetied to the unit.

5. All load-bearing or potentially load-bearing hardware should be bolted or welded to the piece.

6. The assembled unit should be inspected by a competent person or supervisor before the unit is flown.

TEMPORARY FLOWN SCENERY — PICK-UP POINTS AND LINES

1. The number and placement of the pick-up points on a flown unit should be adequate to prevent any undue stress on or sagging within the unit.

2. The pick-up points on a flown unit should be placed to ensure the structural integrity of the unit. All flying hardware should be bolted or welded to the flown unit.

TEMPORARY FLOWN SCENERY — SOFT

1. Bottom pipe or chain in a pipe or chain pocket should be fastened securely to prevent the pipe or chain from falling out of the pocket.

2. The spacing and strength of ties should be adequate for the weight of the piece.

TEMPORARY FLOWN SCENERY — RIGGING

1. All ropes, chains, bolts, clamps and other elements of the rigging of a flown unit should be of appropriate size and strength for the load that they will bear. Manufacturers' recommendations and guidelines for the use of such materials should be followed where available.

2. The minimum strength-to-load ratio for the elements of the rigging of a flown unit is eight–to–one.

3. Turn-buckles, trim chains and other devices for the adjustment of the trim of a flown unit should be secured in position.

4. Any ropes, chains or other lines on which scenery is flown should be safely terminated and secured.

FALL ARREST SYSTEMS AND EQUIPMENT

1. Fall arrest practices, procedures and equipment are specified in section 85 of the Regulations under the Act.

   NOTE: Section 2 of the Regulations permits alternative, equivalent arrangements. The Regulations for Window Cleaners and Construction Projects should be consulted for alternative fall arrest systems.

SOUND LEVELS

It is a unique characteristic of the live performance industry that performers and support staff are critically dependent on their hearing.

Acceptable sound levels have recently been the subject of re-assessment in Canada and the United States. The Occupational Safety and Health Administration in the U.S. recommends lowering the present limits. The Advisory Committee agrees that the present regulations for noise exposure limits and hearing protection (Regulations for Industrial Establishments, section 139) are not adequate for workers in live performance, and is recommending that the Ministry of Labour develop a new regulation to address this concern.

The following recommendations are intended to help prevent short- and long-term auditory damage to workers without affecting artistic integrity.

DEFINITIONS

dB (Decibel). A measure of sound pressure level.

Exchange rate. The increase in dB that doubles the damage done by sound exposure.

Hearing conservation program. Any action that will result in lowering the potential for hearing damage. It may involve the reduction of sound levels or the use of personal hearing protection.

Impulse sound. Percussive sound such as gunshots or cymbal crashes. The sound is often very loud and may have peak dB levels over 115 dB.

Leq. Equivalent levels over a specified period of time.

Steady state sound. Sound that does not involve the rapid rise and fall of levels as in impulse sound. The sound can be loud but has a more consistent level than impulse sound.

Sound pressure level. The correct term for "sound level". The intensity of sound measured in decibels.

GENERAL GUIDELINES

1. Sound pressure level issues should be identified, addressed and resolved during the rehearsal period and before the first performance.

2. The exchange rate should be 3 dB.

3. Workers should not be exposed to impulse sound pressure levels in excess of 100 dB. Where sound levels above 100 dB cannot be avoided, a hearing conservation program shall be established to reduce the exposure to 100 dB or less.

4. Workers should not be exposed to steady state sound pressure levels in excess of 85 dB. Above this threshold, a hearing conservation program should be implemented to reduce the exposure to less than 85 dB.

5. Sound pressure level readings should be taken with a Type 2 sound meter that meets the CSA Standard Z107.2 rating. The meter should be set for the "A weighted network" with a slow meter response when measuring. Steady state sound pressure levels should be measured for a period of one minute to establish an leq.

6. Sound pressure levels should be measured at the ear of the worker most exposed to the sound source. All measurements should be taken at performance levels.

7. Hearing conservation programs are the mutual responsibility of workers and management and shall have the agreement of all parties involved. Both workers and management should understand the importance of annual hearing assessments.

8. Where a hearing conservation program is in place, an assessment log should be kept as proof of maintenance and "signed off" by both management and workers.

9. In hearing conservation programs for long-running productions (in excess of six months), all workers in the program should have periodic hearing assessments.

SOUND LEVEL REDUCTION GUIDELINES

The best way to reduce sound impact is to put a distance between source and worker. Even in a limited space, repositioning or re-angling the sound source can make a useful difference.

1. **Hearing protection:** Uniform attenuator ear plugs are available in custom and non-custom forms. Other types of hearing protection are available for specific situations. An audiologist or other hearing health care professional should be consulted before choosing.

2. **Speakers:** Speakers and monitors should have minimal floor contact since low frequencies tend to travel through solid surfaces rather than through air. Reducing the surface contact of speakers and monitors will increase the low end frequencies received by audience and performers, so the overall sound level need not be as high. Workers should not be exposed to the backs of open speaker enclosures. Baffles between the worker and the speakers should also be used.

3. **Risers:** Raising the sound source 30-60 cm (1-2 ft.) above the ear of the affected worker greatly reduces high frequency sound exposure. Because high frequency sounds, typically those produced by a speaker horn or a belled musical instrument, are directional, sound pressure levels above, below or to the side of the source are significantly lower than those in front of it.

4. **Spacing:** Wherever possible, 2-3 m (6-8 ft.) of reflective floor surface should be left unoccupied in front of a performance group. This generates additional reflections, which raise the sound level in the audience but not on stage, so the overall level need not be as high.

5. **Isolation of impulse sound:** Workers should not be within 2 m (6 ft.) of an impulse sound. Wherever possible, shields and baffles should be used and reflective surfaces around the sound source should be acoustically treated to reduce the impulse effect. Where it is not possible to isolate the worker, additional hearing conservation should be used.

6. **Sound baffles and acoustical shields:** Baffles and plexiglass shields may give protection if used with other strategies to reduce the overall sound exposure. However, acoustical baffles afford minimal effect unless they are within 18 cm (7 in.) of the worker's head. In addition, the maximum high frequency attenuation is only about 15-17 dB.

STAGE COMBAT/STUNTS AND WEAPONRY

In these guidelines a fight/stunt director is a competent person responsible for staging and co-ordinating all fights/stunts.

In these guidelines the weapons handler is a competent person responsible for the safety and security of all weapons.

DEFINITIONS

Live ammunition. Ammunition capable of firing a projectile.

Staged fight/stage combat. A co-ordinated series of moves creating the illusion of violent intent, requiring specific timing and skill, involving either unarmed combat or the use of weapons.

Stunt. Any activity that is not normally executed by the average person and that performed incorrectly would most likely result in bodily injury.

Weapon. Any object used in a staged fight for attack or defence.

STAGE COMBAT/STUNTS

1. All stage combats and stunts should be choreographed or arranged by a fight/stunt director who has specific knowledge of the requested type of stunt.

2. The fight/stunt director should be consulted about the design of the physical elements (scenery, props, costumes and weapons) for the production.

3. The fight/stunt director should always take into account the physical limitations, training and skills of the individual artists.

4. When a fight/stunt director is not engaged for the duration of the production, a competent person should be chosen to observe fight rehearsals and consult with the fight/stunt director during rehearsals on all aspects of the fight/stunt, and to conduct and monitor all run-throughs of the fights/stunts prior to each performance.

5. Fights and stunts should be given adequate rehearsal time, such time requirements to be made in consultation with the fight director.

6. The actual weapons(s), prop(s), costume(s), footwear and stunt equipment used in the fight/stunt should be made available to the performer(s) to allow for adequate rehearsal time.

7. Stunts and fights should not be performed or rehearsed in temperatures or weather conditions that could compromise the safety of the participant, and in no case shall the temperature in an enclosed workspace be below 18°C as prescribed in section 129 of the Regulations for Industrial Establishments.

8. Rehearsal rooms should be of a size to allow for the safe use of weapons.

9. Appropriate first aid equipment, including ice packs, must be accessible.

10. There should be a person with first aid training present at all fight rehearsals and performances. Access to a telephone should be readily available in case of an emergency.

11. During fights/stunts visibility and visual perception shall be adequate to ensure the safety of the performers.

12. The floor surface should be free of debris and allow for secure footing for the performers.

13. The danger of repetitive strain and bruise injuries should be minimized.

WEAPONS — GENERAL

1. All weapons are dangerous. Never indulge in horseplay while in possession of any weapon.

2. Only weapons specifically made and designed for stage combat or approved by the fight director should be used. Ornamental (costume), antique or ceremonial weapons shall not be acceptable.

3. The fight director should be responsible for determining the safety of all weapons. In the absence of the fight director, the weapons handler should be responsible.

4. The weapons handler should maintain all weapons in safe working order and, if necessary, replace them.

5. The weapons handler may designate any necessary assistants and should be given adequate time to familiarize them with the procedures they must follow.

6. The only people to handle the weapon(s) shall be the weapons handler or assistant(s) and the performer who is to use it.

7. There should be a fight run-through on the day of each performance.

8. All weapons shall be secured when not in use.

WEAPONS — FIREARMS

1. Firearms should be treated as loaded at all times.

2. Live ammunition must NEVER be used.

3. Smoking should not be permitted in any area where ammunition or powder is stored, and appropriate signs should be posted.

4. All pertinent federal, provincial and municipal laws and regulations shall be applied.

5. The weapons handler should:

   - have the appropriate licences for the weapons in use;
   - be familiar with the inspection and loading/unloading procedures for such weapons;
   - be familiar with the applicable laws and regulations concerning the handling, transportation and storing of any blank ammunition, powder, etc. that may be required.

6. The weapons handler should be responsible for test firing all weapons to determine the safe working distance.

7. Firearms should be loaded as close to their "entrance" time as practicable.

8. Firearms shall be unloaded before storing.

9. Only the weapons handler or a designated assistant should load or unload a weapon.

10. In the event of a misfire or jam, only the weapons handler should attempt to fix it. If the handler is not sure what is causing the problem, the weapon shall be taken out of use until the cause can be determined.

11. Under no circumstances should a firearm be pointed at anyone.

12. Never fire a gun with dirt, sand or any foreign blockage in the barrel. Never put a weapon down in such a way that dirt or sand might cause a blockage.

13. All personnel with the production should be notified that weapons will be fired.

WEAPONS — BLADED

1. All weapons should have their points made safe and their blades properly balanced.

2. All handles should provide a secure hold under fight conditions.

3. Retractable and non-retractable weapons should be set out separately and be clearly marked so that one cannot be mistaken for the other.

4. Each actor should use the same weapon in all performances and pre-performance run-throughs.

5. Performers should check their own weapons prior to each performance in the presence of the weapons handler.

ELECTRICAL

This guideline deals only with those electrical issues that involve either the temporary elements of a show moving into a permanent facility, or the setup of a temporary performance venue.

Employers have a duty under section 25(2)(h) of the *Occupational Health and Safety Act* to take every precaution reasonable in the circumstances for the protection of a worker. The measures and requirements set out in this guideline may be considered to be reasonable precautions. Much on the subject of electrical installations concerning permanent theatre equipment can be found in the **Ontario Electrical Safety Code (OESC)**. The OESC deals in detail with permanent theatrical electrical installations. This Guideline highlights sections of the OESC that apply to the temporary and innovative nature of the live performance industry.

In most cases, where a specific aspect of the installation is not clear within the OESC, the installation should use alternative methods to achieve an equivalent level of safety while creating the desired effect.

Electrical equipment must, by law, be approved by and bear the certification mark of a certification organization, accredited in accordance with the Standards Council of Canada Act.

Ontario Ministry of Labour (MOL) has the right to enter any workplace for the purpose of enforcing the Occupational Health and Safety Act, and related regulations. The MOL has the right to shut down any equipment or systems which do not comply with the Act or related Regulations and present a hazard to a worker.

Electrical Safety Authority (ESA) enforces the OESC and has the right to enter any premises which uses electrical power and to shut down any equipment or systems which do not comply with the Code and which present a hazard to the public.

See Appendix A for examples of current certification organizations.

DEFINITIONS (primarily based on Ontario Electrical Safety Code)

Ampacity. The capacity of a substance to carry an electrical current. It is measured in amperes.

Ballast. A resistor, transformer, or electronic circuit used to limit the current to a discharge type of light source. Typically used with fluorescent tubes, HID, HMI, CID, XENON, etc. luminaires.

Bonding. A low impedance path obtained by permanently joining all non-current-carrying metal parts to assure electrical continuity and having the capacity to conduct safely any current likely to be imposed on it;

CAM-LOK*(^{TM}). A trade name that has become generic. A brand of single pin locking connectors with molded rubber or Santoprene*(^{TM}) insulators, commonly used for mains portable power distribution on stage, studio and location projects.

Cordset. An assembly of a suitable length of flexible cord or power-supply cable provided with an attachment plug at one end and a cord connector at the other end.

Competent. A competent person means a person who;

(a) is qualified because of knowledge, training and experience to organize the work and its performance,

(b) is familiar with the Occupational Health and Safety Act and the regulations that apply to the work, and

(c) has knowledge of any potential or actual danger to health or safety in the workplace.

Electrical Cable. A flexible cord used to supply electrical power.

Electrical Distribution Box. A device which permits the branching of power to two or more loads or additional distribution boxes. Usually consists of breakers or fuses feeding 120V single-phase female connectors (line, neutral and ground). Per Table 1 and 1A of the Electrical Safety Authority Spec 003. See Appendix B.

Grounding. A permanent and continuous conductive path to the earth with sufficient ampacity to carry any fault current liable to be imposed on it, and of a sufficiently low impedance to limit the voltage rise above ground and to facilitate the operation of the protective devices in the circuit.

Luminaire. A lighting fixture consisting of a light source, socket, enclosure, electrical wiring and connector. It may include switches, reflectors, lenses, ballasts, supporting devices, and other apparatus for altering the quantity and quality of light emitted by the apparatus.

Ontario Electrical Safety Code (OESC). The standard for temporary or permanent electrical installations in Ontario. It comprises CSA Standard C22.1-02 Canadian Electrical Code, Part 1 and Ontario amendments to the Canadian Electrical Code, Part. 1, C22.1-02, bulletins and Specs.

Power Source. Anything that can provide voltage and electrical current, that is, electrical power.

Polarized Connector. A connector that is designed so that its contacts will engage in one way only.

Polarized Receptacle. A female contact device installed at an outlet for the connection of one attachment plug.

Single-Pin Connectors. An approved locking outdoor-rated connector with one pin, rated up to 400 amps. Generally colour coded to designate phasing. (See #5 Equipment in this Guideline and OESC 66-456(2)).

Temporary Installation. Any electrical installation that is not fixed to a facility. For example, equipment that is rented, or equipment that is installed for a production , to be removed when such a production is over or moved.

Wire Connector. A device which connects two or more conductors together, or one or more conductors to a terminal point, for the purpose of connecting electrical circuits.

GENERAL RULES

1. All electrical installations must be acceptable to the Electrical Safety Authority. This may be determined by a direct inspection, or by other arrangements that have been made with the Electrical Safety Authority.

2. The Electrical Safety Authority offers a Continuing Safety Services program. It may be helpful to contact the Electrical Safety Authority for further information about this program.

3. All electrical equipment shall be approved.

4. All personnel involved with the use of electrical equipment shall be competent in the job they are required to perform.

5. Personnel required to draw power from a power grid to any electrical equipment shall be able to determine the electrical needs of each component of that power grid back to the power distribution grid within the facility.

6. Before work is begun, a competent person should plan (using inquiry, observation, and measurement) to avoid bringing any person, tool or machine into a hazardous situation, electrical or otherwise.

7. Workers and other personnel in a facility should be warned to stand clear when a temporary installation has its power supply connected and activated for the first time.

8. Re-lamping should be done with the power supply to the lamp turned off. If the re-lamping operation would expose a worker to a possibly energized bare part of the electrical equipment, the equipment shall be de-energized and locked out before re-lamping takes place.

9. Lighting and other electrical fixtures shall be de-energized and locked out before being opened for repairs or maintenance.

10. Each receptacle should identify the circuit that powers it. Each connector in a multiple-circuit cable should identify the circuit to which it is connected.

11. Equipment used outdoors or in damp or wet locations shall be suitable for those conditions. The power supply in such locations shall pass through a Type A ground fault circuit interrupter (GFCI)[a]. The Type A GFCI is designed to trip at 5 milliamps.

TEMPORARY POWER DISTRIBUTION

1. Continuous grounding and bonding must be provided throughout any electrical distribution system. No local grounding shall be permitted. No down-stream bonding of the neutral shall be used.

2. Portable switch boards and dimmers should be:
   - accessible for emergency power shutdown;
   - located so they will not obstruct any exit; and
   - protected from damage from objects or persons that are near or must pass near them.

3. Care should be taken not to walk on or drive over electrical cables. All cables subject to vehicular or extensive pedestrian traffic shall be protected in an appropriate manner.

4. Proper protective equipment should be worn and used.

5. Where premises are serviced from two electrical sources, the electrical sources should have a common ground.

6. The power supply panel should be readily accessible to allow power shutdown.

7. All power feeds should be covered or guarded to avoid a tripping hazard in pedestrian walkways or roadways.

8. All distribution boxes, electrical outlets, and cable connectors shall be installed in locations for which they are approved, unless suitably protected from damage.

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[a] Not an OESC requirement

9. Portable distribution panels, switch boards and dimmer packs should:

   - be properly connected to an approved fused or breaker supply panel;
   - be connected with a cable of sufficient size and ampacity to carry the full rating of the supply fuse or breaker; and
   - never be connected to bypass the fusing of the supply panel.

EQUIPMENT

1. Equipment connected to a power source shall bear an electrical approval label. (See Appendix A.)

2. Electrical equipment should be inspected before use and should have regular inspection and maintenance to preserve manufacturer specifications.

3. At no time should grounded equipment have its connector replaced with a polarized connector, nor should it be plugged into a non-grounded circuit.

4. All electrical devices that become hot during use should be shielded or kept a suitable distance from flammable or combustible materials.

5. Electrical equipment should be protected from exposure to excessive moisture, gases, vapours, fumes, liquids, heat, cold, or other agents which could have a deteriorating effect on the electrical insulating qualities of the equipment.

6. Electrical equipment shall be installed only in locations for which it is approved, unless suitable precautions are taken to protect it from damage.

LIGHTING

1. Scaffolds and other metal grids/pipes/structures used to support lighting or power distribution shall be effectively bonded to ground.

2. Lighting fixtures, lamp holders, lamps, props and receptacles should not have live parts exposed.

3. Workers using high voltage or high pressure light sources (HMI, HID, CSI, neon and fluorescent fixtures) should:

   - be trained in their use;
   - be familiar with the ballasts used; and
   - ensure that all safety devices are in proper working condition.

4. When changing and handling any lamp, personnel should follow all the manufacturer's safety recommendations.

5. Any open-faced lighting fixture using a quartz halogen lamp, or other high pressure lamp, should have protection against the shrapnel effect caused by an exploding lamp. Such protection may be in the form of a safety glass or safety screen. Workers should ensure that the safety device is reinstalled properly after re-lamping or adjustment.

6. A suitable secondary fall restraint should be used to prevent a fixture or its accessories from falling. The fall restraint should have a breaking strength great enough to stop the dynamic load of the falling fixture and/or accessories.

7. The distance that a fixture may fall before being stopped by its fall restraint shall be such that no strain would be placed upon its electrical cord.

8. Emergency lighting shall conform to Section 46 of the OESC.

ELECTRIC CABLES

1. All electrical cables and connecting components:
   - should be provided by an approved manufacturer;
   - shall be approved for the purpose;
   - should have polarity identified;
   - should be grounded; and
   - should be properly assembled.

2. Electrical cables shall be adequately secured so as not to put strain on the connector or cause undue wear or damage to the cable, insulation of the cable, terminals of any electrical apparatus, devices, or joints as per OESC 12-100, for Types of Conductors and OESC 12-120, for Supporting of Conductors.

3. Connectors and cabling of single pin distribution systems shall be provided with standard colour coding:

Red, Blue, Black	Live
White	Neutral
Green	Ground

4. Where single, i.e. not bundled, conductor cables are used, the colour codes shall be applied with coloured tape at both ends of each cable before the cables are connected.

5. Electrical cables should be in good repair.

6. Electrical cables should be protected from wear and damage such as crushing, abrasion, and shearing. If electrical cables or the insulating casing are found to be damaged they are to be replaced or not used.

7. Electrical cables should not be fastened or suspended in such a way that the insulating cover could be damaged.

8. Cables should not be spliced.

ENVIRONMENT

1. When working on or close to energized electrical equipment, ladders made of conductive materials shall not be used (Regulations for Construction Projects O. Reg. 213/91, s. 194).

2. Prior to climbing any temporary structure that carries elevated electrical equipment, an inspection should be made to ensure that the structure is stable and properly erected.

3. In outdoor locations, particular care should be taken to bond to ground any structures which support electrical equipment.

EMERGENCIES

1. No repairs or alterations shall be carried out on any live equipment except where complete disconnection of the equipment is not practicable.

RESOURCES

The Electrical & Utilities Safety Association of Ontario (E&USA) provides a variety of electrical safety awareness programs for electrical and non-electrical workers. For example, the Electrical Safety and Awareness training programs familiarizes participants with electrical oriented operations and pinpoints both general and electrical hazards. An Electrical Lockout/Tagout training program is also available.

E&USA may be contacted by phone at 1-800-263-5024 or at their website www.eusa.on.ca.

Reference to external resources and websites are offered for convenience of users in accessing related information. These references and links do not necessarily constitute an endorsement of the resources or websites. The Ministry of Labour takes no responsibility for the views, contents or accuracy of the information presented by external sources.

RAKES

In these guidelines,

Ladder is used to include both straight or extension ladders, that must be supported, and "A" frames that are self-supporting.

Scaffold is used to include pre-made scaffolding, scaffolding made from pipes mechanically joined together, known as tube and clamp scaffolding, and vertical ladders with platforms known as cherry pickers or tallescopes.

DEFINITIONS

Rake. An acting area that is not horizontal.

Raked Stage. A stage where most or all of the deck is raked.

Raked Area. A portion of the stage which is raked.

Ramp. A means of getting from one acting area to another.

Counter-rake. An angled platform placed on a rake to create a horizontal area on the rake.

Manlift. A device used to lift a worker; may be electric, hydraulic, pneumatic or mechanical.

POTENTIAL CONCERNS

1. Tripping: The greater the rake, the higher the risk of stumbling or falling. It is generally considered that an unsafe rake is one that exceeds an incline of one inch in twelve inches.

2. Misstepping: Changing levels can be hazardous, especially when moving between a rake and a level surface. The risk is magnified as the rake is increased.

3. Loose objects: Any object on a rake can roll, slide or fall down a rake, and is therefore a potential hazard. Objects include but are not limited to rolling or falling props, ladders, scaffolding, people, tools, and scenery.

4. Strain injuries

WORKING ON A RAKE

1. There should be adequate rehearsal on the rake so that all concerned become accustomed to the conditions. In determining "adequate" rehearsal, consultation prior to and during rehearsals, with performers and others working on the rake, is of utmost importance. Lack of rehearsal time combined with an unfamiliar surface can lead to occurrences.

2. Frequent rest periods off the rake are recommended for anyone who is required to work on a rake. There should be a horizontal surface in the immediate area. If possible, a counter-rake should be considered.

WORKING WITH LIFTS/LADDERS/SCAFFOLDING ON RAKES

1. All work platforms should be made horizontal.

2. When a counter-rake is used to make the work platform horizontal, the lift, ladder or scaffolding on the platform should be rendered immobile. The counter-rake should be engineered to sufficiently support the worker and any equipment required to perform the task. The counter-rake should also be secured to prevent slipping.

3. When the legs of the lift, ladder or scaffolding are adjusted to make the unit vertical, the unit shall be secured to prevent it from moving.

4. Regardless of the angle of the rake, the ladder shall always be set up on a horizontal base.

MOVABLE SCENIC UNITS ON A RAKE

1. Movable scenic units on a rake should have a braking and locking mechanism to prevent the unit from tipping over or rolling off the rake.

2. When moving large units on a rake, a secondary safety device shall be used. Such devices may include, but are not limited to tethers, stops, construction methods, shape of the object and wedges.

3. All units, static or moving, shall be constructed to minimize tripping hazards.

4. Rakes shall have the structural integrity to support any and all loads applied to them.

SCENERY AND PROPS

1. Adequate measures shall be taken to prevent props and scenery from inadvertently rolling down the rake. Measures may include, but are not limited to, tethers, stops, construction methods, shape of the object and wedges.

2. Props and scenery shall be constructed to avoid tripping hazards.

3. The weight and balance of a prop or costume should be considered when designing for use on a rake.

4. (Refer to the HAND PROPS AND COSTUMES Guidelines)

SURFACE TREATMENT

1. In determining the surface treatment, consideration should be given to the pitch of the rake and the requirements of the performance.

FOOTWEAR

1. Special consideration should be given to the choice, construction and treatment of footwear.

2. The footwear should be made available as close to the beginning of the rehearsal period as possible.

3. Footwear should be properly maintained.

FOG and SMOKE

DEFINITIONS

Both smoke and fog are suspensions of solid particles or liquid droplets in air. Each may be accompanied by one or more gases.

Smoke. For the purposes of this document the term smoke will refer to a suspension that rises, expanding indefinitely.

Fog. For the purposes of this document the term fog will refer to a suspension that falls, being heavier than air. This includes smoke that has been chilled.

MSDS. Supplier Material Safety Data Sheet that provides comprehensive information on a WHMIS controlled product, relating to its handling, storage, use and known health effects.

REGULATORY REQUIREMENTS FOR CHEMICALS

Regulation 833 entitled Control of Exposure to Biological or Chemical Agents and Workplace Hazardous Material Information System (WHMIS) legislation apply to all the chemicals used for fog and smoke such as glycols, dry ice, liquid nitrogen etc. Regulation 833 prescribes limits for daily and weekly exposure of workers to biological or chemical agents. Exposure is to be controlled using engineering controls, work practices, hygiene facilities and practices and in certain situations personal protective equipment. WHMIS is designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, there are three ways in which information on hazardous materials is to be provided:

- labels on the container of hazardous materials;
- material safety data sheets to supplement the label with detailed hazard and precautionary information; and
- worker education

GENERAL GUIDELINES

1. Dry ice and liquid nitrogen are commonly used and safe-handling procedures must be followed.

2. Only fog/smoke products that have a Supplier Material Safety Data Sheet (MSDS) that meet WHMIS requirements should be used.

3. Some products use proprietary formulas, concealing the identity and proportion of ingredients. Products whose MSDSs clearly identify the chemical ingredients with precautions in safe handling should be preferred.

4. Fog/smoke products should be used exactly as the manufacturer directs and should not be adulterated or altered in any way such as by adding dyes, fragrances or additional chemicals. Coloured fog can be achieved with coloured light.

5. Fog/smoke generating machines should be used and maintained in good condition as required by the *Occupational Health and Safety Act*.

6. Fog/smoke generating machines or other sources should be located to minimize exposure to the concentrated smoke or fog as it is created.

7. Fog/smoke outlets should be located well out of traffic areas. Residue can be tracked well beyond the area of use and may create a slipping hazard. See Regulation 851, Section 11(a) for Industrial Establishments.

8. The theatre's regular first aid and emergency plan should include response to severe reactions to fog and smoke.

9. Prior to workers' engagement for any production with fog/smoke effects, the workers should be told the type of chemical fog/smoke product that will be used. The MSDS on the fog/smoke shall be available to workers on request prior to engagement and workers shall be given instruction/training on safe handling and use of the chemicals.

10. High-risk individuals should not be exposed to smoke and fog. This group includes, but is not limited to, children, people with severe lung problems and/or asthma, pregnant women and people with serious illnesses including AIDS.

11. Respirators equipped with appropriate filter cartridges shall be used when circumstances warrant. Filter cartridges should be used according to manufacturers' recommendations and selected based on the chemical hazards present.

12. Persons should not be assigned to tasks requiring use of respirators unless they are physically able to perform the work and use the equipment. Workers required to wear respirators who experience breathing difficulty while using respirators shall be referred to a physician for evaluation.

13. Exposure to fog and smoke during strenuous physical activity should be minimized.

14. Individuals who experience adverse reactions to fog and smoke exposure should be immediately removed to a well-ventilated area and the theatre's first aid or emergency providers should be notified.

15. If an adverse reaction occurs, the occurrence should be investigated by the departmental supervisor, stage manager and/or shop steward.

16. A written report of the findings should be made to the Joint Health and Safety Committee or Health and Safety Representative, and appropriate labour and management associations. The individual experiencing the reaction should be given a copy of this report.

SMOKE

One of the most common methods of producing smoke is by passing a fluid under pressure through a heating unit, causing the fluid to vaporize. Only machines designed and manufactured for the generation of stage smoke should be used. The relationship between fluid composition and temperature settings and other internal features of the generating equipment is critical. Under-heating of a fluid may lead to a wet smoke that will leave a residue, and over-heating of the fluid may lead to fluid decomposition.

There are two main types of smoke fluids: Glycol-based products and Oil-based products, and two other, less satisfactory, ways of producing smoke: Fumed Inorganic Chemicals and Burned Organic Chemicals.

A. Glycol-based Products Often called "water based", although they contain more chemicals than water.

1. Ensure that the generating machine is operating properly;

   - appropriate rate of compression,
   - correct temperature of heating coil.

   (See the effects of under- and over-heating referred to above.)

2. These fluids should be in a secured container while in use.

3. As these smokes condense and settle on surfaces, they leave a minute film of slippery liquid, especially in the immediate area of the smoke outlet. This may produce a hazard. See Regulation 851, Section 11(a) for Industrial Establishments.

4. Propylene Glycol and Butylene Glycol are more commonly used than Monoethylene Glycol and Diethylene Glycol because they are less hazardous. .

5. Glycols are hygroscopic, meaning they absorb water out of the atmosphere. This may cause respiratory and eye irritation. People wearing contact lenses are especially vulnerable to eye irritation.

B. Oil-based Products "Petroleum based" or organic (vegetable) products. These fluids are less appropriate fog/smoke products than glycol.

1. Any oil in aerosolized form can be combustible - even explosive - at the wrong concentrations. Naked flame and sparks should not be permitted near oil-based smoke.

2. Only 100% food grade organic oils, or highly refined clear mineral oils should be used. Identify any vegetable oils present since there are people who are allergic to certain vegetables.

3. Avoid fluid containing "industrial grade" oils such as fuel oil, cutting oil and paraffin oils. These contain impurities that may cause adverse reactions.

4. Like Glycol-based products, oil aerosols can cause extremely slippery surface conditions. See Regulation 851, Section 11(a) for Industrial Establishments.

5. A Class B portable fire extinguisher shall be located near the location where the oil-based products are used as per section 123(1) of Regulation 851.

6. All electrical equipment that may be affected by the combustible liquid while it is in aerosol or mist form shall meet the requirements of Part 18 of the Ontario Electrical Safety Code for a Class 1 hazardous location. The density of the aerosol or mist cloud will influence the determination as to whether the location is a Division 1 or Division 2 location.

7. Smoke fluid containers and the equipment used to make the aerosol or mist shall be bonded together and to ground as per Section 22(4)(b) of Regulation 851.

C. Fumed Inorganic Chemicals Chemicals that fume when heated, creating tiny airborne particles.

1. The majority of smoke products of this type are chlorides, which are all respiratory irritants.

2. Ammonium Chloride (Sal Ammoniac Powder) is considered the least irritating, although heavy exposure should be avoided.

3. All other chlorides should not be used.

D. Organic Materials Smoke can be produced by burning frankincense, rosin, charcoal, tobacco, paper, naphthalene, rubber, etc.

1. Any burning materials will produce carbon dioxide, carbon monoxide, and a host of irritating and toxic gases, vapours, and fumes. Exposure should be limited.

2. Smoke from pyrotechnic effects should be treated as burned organic material.

NOTE: PYRO is regulated under Federal regulations. The Explosives Regulatory Division (ERD) of Natural Resources Canada is responsible for the administration of the *Canada Explosives Act* - an act that regulates matters related to explosives and pyrotechnics. ERD offers a Pyrotechnic Special Effects Course. This one-day course serves to promote the safe use of all pyrotechnics and special-purpose effects as used in entertainment and performing arts. For more information, contact:

Natural Resources Canada
Explosives Regulatory Division
580 Booth Street, 15th Floor
Ottawa ON K1A 0E4
Attention: John Hendrick
Senior Inspector of Explosives
Tel: (613) 995-8439
Fax: (613) 943-8305

E. A/B Smoke Acid and base smoke.

1. Highly irritating and toxic. Do not use.

2. This smoke is produced when two different chemicals, commonly cyclohexylamine and acetic acid, interact. (This is not to be confused with A/B PYRO.)

FOG

There are two common ways of producing fog. One is by chilling smoke, in which case the SMOKE guidelines apply. The other method is by condensing the natural moisture in the air, using extremely cold materials such as dry ice (frozen carbon dioxide) or liquid nitrogen.

1. Dry ice or any other chilling agent must be handled with caution. Directly exposing skin to dry ice or other chilling agents can cause severe frostbite.

2. Caution should be exercised when breaking up dry ice. Personal protective equipment such as eye protection and gloves shall be used in the handling of dry ice.

3. Dry ice and liquid nitrogen should be transported and stored in the container provided by the supplier or transferred to a suitable container. The container shall be clearly labelled and such labels shall remain plainly visible. The handling and transportation of all compressed gas cylinders shall meet WHMIS and TDC (Transportation of Dangerous Goods) requirements.

4. Because carbon dioxide and nitrogen displace oxygen, adequate ventilation must be ensured in low-lying areas and confined spaces, including, but not limited to, orchestra pits, trap rooms and stairwells.

OUTDOOR VENUES

PREAMBLE

These guidelines deal mainly with warm/hot weather conditions. Future guidelines will be expanded to include conditions in cold weather.

Although weather and environmental conditions present challenges to performances taking place outdoors, outdoor sites are workplaces and must abide by the health and safety requirements set out in the *Occupational Health and Safety Act* and the applicable regulations.

The Legal Requirements (based on the Ministry of Labour Health and Safety Guideline for Heat Stress): "Employers have a duty under section 25(2)(h) of the Occupational Health and Safety Act to take every precaution reasonable in the circumstances for the protection of a worker. This includes developing hot environment policies and procedures to protect workers in hot environments due to hot weather. The measures, requirements and limits set out in these guidelines may be considered to be reasonable precautions. In addition, to help facilitate compliance with the Act, the Ministry of Labour also recommends reference to the current edition of Threshold Limit Values (TLVs) for Heat Stress and Heat Strain published by the American Conference of Governmental Industrial Hygienists (ACGIH) as a source of further information. These values are based on preventing unacclimatized workers' core temperatures from rising above 38°C."

DEFINITIONS

Acclimatization. Heat acclimatization improves the tolerance for heat stress, with a reduction in heat strain. Acclimatization develops over a 1 to 3 week period to exposure to hot temperatures and physical activity, in healthy people. Acclimatization is lost after 4 days away from exposure.

Air Quality Advisory. An alert issued when air quality is expected to be poor because of ground level ozone, the main component of summer smog. An advisory is issued when the Air Quality Index is more than 50.

Heat Exhaustion. A condition caused by heat stress. Symptoms include weakness, headache, fainting, sweating, thirst, nausea and vomiting, and muscle cramps.

Heat Strain. The body's physiological response to heat stress.

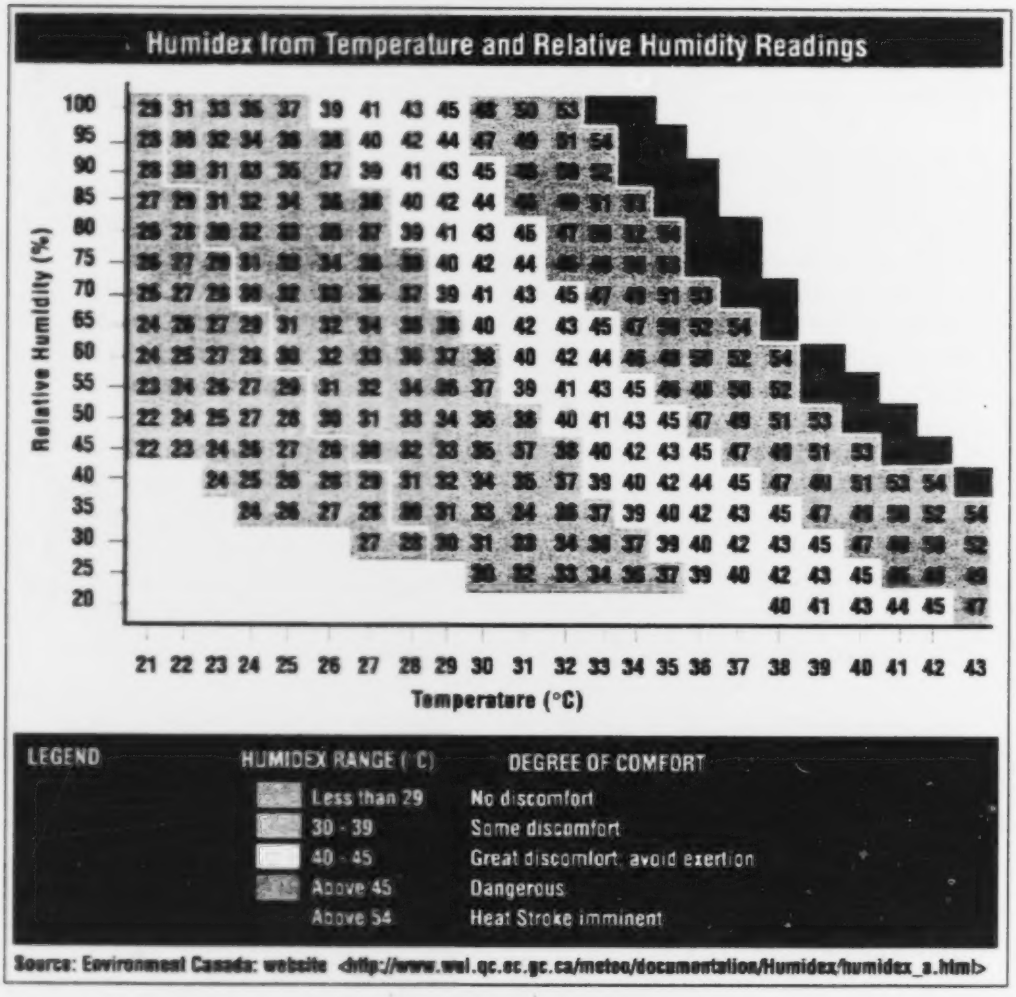
Heat Stress. The load that heat puts on the body through the environment and activity.

Heat Stroke. A condition occurring when heat causes the body's cooling system to fail, so that the core body temperature rises to critical levels of 41 degrees Celsius or more.

Symptoms include confusion, irrational behavior, hot dry skin (usually with a lack of sweating), loss of consciousness and collapse.

Humidex. Humidex values represent the effect which high humidity and high temperature have on the human body. The higher the humidex, the harder it is for perspiration to evaporate and cool the body and the greater the risk of heat strain.

Humidex Advisory. An alert issued when the temperatures are expected to exceed 30° C and the humidex values are expected to exceed 40° C.



Weather Advisory. An alert that actual or expected weather conditions may cause general inconvenience or concern, but do not pose a serious enough threat to warrant a weather warning.

Symptoms include confusion, irrational behavior, hot dry skin (usually with a lack of sweating), loss of consciousness and collapse.

Humidex. Humidex values represent the effect which high humidity and high temperature have on the human body. The higher the humidex, the harder it is for perspiration to evaporate and cool the body and the greater the risk of heat strain.

Humidex Advisory. An alert issued when the temperatures are expected to exceed 30° C and the humidex values are expected to exceed 40° C.

Humidex from Temperature and Relative Humidity Readings

Relative Humidity (%)	Temperature (°C)																						
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
100	29	31	33	35	37	39	41	43	45	48	50	53	55	58									
95	28	30	32	34	36	38	40	42	44	47	49	51	54	56	59								
90	28	30	31	33	35	37	39	41	43	45	48	50	52	54	57	59							
85	27	29	31	32	34	36	38	40	42	44	46	49	51	53	55	58							
80	26	28	30	32	33	35	37	39	41	43	45	47	50	52	54	56	59						
75	26	27	29	31	33	34	36	38	40	42	44	46	48	50	53	55	57						
70	25	27	28	30	32	33	35	37	39	41	43	45	47	49	51	53	56	58					
65	24	26	27	29	31	32	34	36	38	40	42	43	45	47	50	52	54	56					
60	24	25	27	28	30	32	33	35	37	38	40	42	44	46	48	50	52	54	57				
55	23	24	26	27	29	31	32	34	36	37	39	41	43	45	46	48	50	52	55	57			
50	22	24	25	27	28	30	31	33	34	36	38	40	41	43	45	47	49	51	53	55	57		
45	22	23	24	26	27	28	30	32	33	35	37	38	40	42	43	45	47	49	51	53	55	57	
40			24	25	26	28	29	31	32	34	35	37	39	40	42	44	45	47	49	51	53	54	56
35				24	26	27	28	30	31	33	34	36	37	39	40	42	43	45	47	49	50	52	54
30							27	28	30	31	33	34	36	37	39	40	42	43	45	47	48	50	52
25										30	32	33	34	36	37	39	40	42	43	45	46	48	49
20																		40	41	43	44	45	47

LEGEND	HUMIDEX RANGE (°C)	DEGREE OF COMFORT
	Less than 29	No discomfort
	30 - 39	Some discomfort
	40 - 45	Great discomfort; avoid exertion
	Above 45	Dangerous
	Above 54	Heat Stroke imminent

Source: Environment Canada: website <http://www.wul.qc.ec.gc.ca/meteo/documentation/Humidex/humidex_a.html>

Weather Advisory. An alert that actual or expected weather conditions may cause general inconvenience or concern, but do not pose a serious enough threat to warrant a weather warning.

Weather Warning. An alert that severe weather is occurring or that hazardous weather is highly probable.

Weather Watch. An alert that meteorological conditions may result in the development of severe weather.

Wind speed.
1. Light (0-9 km/h)
2. Moderate (10-40 km/h)
3. Strong/windy (41-60 km/h)
4. Very strong/gales (61-90 km/h)
5. Very strong/storm force (over 91 km/h)

Source: Meteorological Service of Canada: website: http://www.msc-smc.ec.gc.ca/cd/brochures/forecast_e.cfm#8

PREPARATION AND PLANNING

1. In the early stages of planning and design, tactics for dealing with different weather conditions should be considered and tested. Such alternative measures should include, but not be limited to, wearing hot-weather costumes, amending fight choreography for hot weather or wet playing surfaces, performing a staged reading, eliminating repertoire, protecting musical instruments, changing performance times, using a different venue

2. In the early stages of planning and design, ensure that all equipment, including back-up lighting, heaters and shelter, is appropriate for use in extreme weather conditions and power failure.

3. Consider prevailing wind direction and sun position for both rehearsal and performance when planning the stage and audience location.

4. Adequate lighting should be available for the workers' safety and needs while performing the various activities in the workplace.

5. The company should recognize that conditions other than temperature and humidity, such as radiant heat (sun, lights), wind, and the kind of activity will affect performers, stage management, technicians, and front of house staff, and should include these conditions in the daily checklist and the policy for cancellation.

6. The company should create a policy for cancellation of rehearsals and performances, including specific criteria, and for implementing one of the planned contingency measures. The policy should outline but should not be limited to

    - the circumstances under which a performance is cancelled (lightning, rain, heat, cold, humidity, radiant heat, wind, air quality, weather watch, weather warning, weather alert, etc.);

- who in management has the authority to make such a decision;
- how long you continue in severe weather;
- how long you suspend the activity;
- a notification process of audience and performers for cancellation of performance due to weather.

7. The cancellation policy should be posted in a designated area available to all workers.

8. If possible, a member of management with the authority to cancel should be present at every performance; otherwise, emergency phone numbers should be provided to the supervisor so that a member of the management can be contacted.

9. Management should assign at least one on-site health and safety officer or designate, who will be provided with a clearly defined set of responsibilities and authority for implementing one of the contingency measures. (See Back Stage, numbers 6, 7 and 8.)

10. There shall be trained first aid personnel on site at all times, in accordance with Regulation 1101, First Aid Requirements, in the Workplace Safety & Insurance Act, 1997.

11. The company should put in place emergency procedures for environment-related illnesses: heat stroke, insect or animal bites, etc. These procedures should be discussed and posted in the designated area.**

12. If the company has arrangements to keep emergency health and contact information, it should be kept in a confidential file on site so that it is quickly accessible for emergency personnel. Confidential medical information should be collected and maintained in a manner consistent with the Personal Health Information Protection Act, 2004.

13. Check with appropriate authority for information on grounds-keeping, evacuation procedures, lighting, pyrotechnics, etc.

** Note that not all areas have the 911 emergency number. The health and safety officer should confirm the number to use.

PREVENTION OF HEAT STRESS (adapted from the Professional and Specialized Services of the Occupational Health and Safety Branch, Ministry of Labour)

1. Increase the frequency and length of rest breaks.

2. Provide cool drinking water near workers and remind them to drink a cup every twenty (20) minutes or so.

3. Train workers to recognize the signs and symptoms of heat stress and start a "buddy system", since people are not likely to recognize their own symptoms.

4. Provide a cool (if possible, an air conditioned) area for rest periods.

5. Where hot weather conditions warrant, workers should be permitted to acclimatize themselves through progressively increased exposure to the heat. Heavy costumes can compound the risk of heat stress, and this should be taken into account when planning an acclimatization schedule.

6. Instead of reducing the exposure times to the hot job, allow workers to become acclimatized by reducing the physical demands of the job for a week or two.

ENVIRONMENT

1. The health and safety officer should have a daily checklist for weather conditions. The checklist should include but not be limited to temperature and relative humidity readings to determine humidex* (see chart in Definitions), radiant heat (sun, lights), work activities, and weather conditions. This checklist will be the basis on which decisions will be made for any changes to the day's performance (see Preparation and Planning, #1).

* Inexpensive thermometers that measure both temperature and relative humidity are available at science stores.

2. Workers should be advised of the presence of potential environmental allergens at the workplace e.g. poison ivy, bees etc. Workers should be encouraged to provide relevant information on any environment-related allergies.

3. Workers should inform the company as soon as possible about any environment-related allergies. Epi-pens, inhalers and similar medical equipment are the responsibility of the individual workers and should be kept easily accessible for their use. First aid personnel on site should: be made aware of workers' allergies, be familiar with the appropriate emergency response in the event of an incident or development of symptoms.

4. Workers should be advised to bring any of the following, if necessary to the outdoor venue: sun hats, insect repellent, sunscreen.

5. Cleaning and maintenance of costumes, footwear and props should include inspection of items for outdoor hazards - dead (or live) insects, bird droppings, etc.

6. Costume and footwear designed for ease of movement should consider the specific, non-traditional playing area.

7. The weight of costume fabric should take into consideration the need for warmth or coolness.

8. Costumes, including footwear, should be able to be modified for extreme weather conditions - layering in the cold, removing layers in the heat or humidity.

9. Costumes, including headgear, should be designed to allow the body the ability to cool or warm when necessary.

10. The backstage, performance, and audience areas should be kept as clear as possible of animals. All droppings, animal hair and debris should be removed before rehearsals and performances

11. Bird droppings should be cleared from all walkways, performance areas, scaffolding and grid as soon as possible. Appropriate personal protective equipment should be worn by those doing the cleaning.

12. Grass should be mowed and raked to cut down on insects, and to help with absorption and evaporation. Mowing and raking should be done as early in the day as possible, as cut grass can trigger allergies.

13. Standing water should be drained.

14. Any streams in the area should be checked for blockage to ensure a free flow. Contact the local authority for policy.

15. The strength and direction of the wind should be taken into consideration when live flame or pyrotechnics are used. The local department should be consulted for a fire safety plan for workers and audience members.

PERFORMANCE SPACE

1. All structures should be erected on firm ground to ensure stability and prevent shifting/movement. Care should be taken to ensure that all structures are securely fastened to the ground and are properly electrically grounded. These structures include but are not limited to tents, scaffolding, trussing, and power supply. Care should be taken that the structures can support the weights and loads placed on them.

2. Take into consideration the effects of rain, lightning, and wind when erecting, dismantling and working on a scaffold or other high, elevated working surfaces or structure.

3. Structures (including guy ropes and supporting poles) and rigging shall be designed by a professional engineer, and inspected and maintained by a competent person. Structures (including guy ropes and supporting poles), rigging and scenic elements should be capable of supporting all loads they may be subject to including very strong wind (61-90 km/h).

4. All electrical equipment shall be suitable for use and certified by CSA (Canadian Standards Association) or ESA (Electrical Safety Authority).

5. Cables and wiring should be routed safely away from public areas. If this is not possible, the cables and wiring must be appropriately protected to avoid damage and tripping hazards. (See Electrical Guidelines.) In the event of rain or high humidity, all non-weather proofed electrical and electronic equipment shall be covered to prevent rain or moisture from entering the unit and ballast.

6. Entrance and exit routes must be clearly identified, adequately illuminated and kept clear of obstructions. Where exit routes are located on uneven ground, temporary flooring or ramps, additional care should be taken to mark and illuminate the routes.

7. All walkways - including performance areas, ramps, exit and entrance areas, paths to dressing rooms and washrooms - should be kept as dry as possible. Open walkways should be covered with material that will allow water to drain away and afford a non-slip surface. All ramps should be covered with a non-skid surface.

8. The playing surface, including rakes, platforms and trapdoors, should be rendered safe for performances in wet weather.

9. In the case of deteriorating weather conditions (potential rain/wind storms, unexpected temperature change), all possible equipment, including but not limited to back-up lighting, heaters, fans, and shelter, should be available and ready to improve conditions.

10. Wing space should be wide enough and kept dry/sheltered for dancers to change into their dance shoes.

BACKSTAGE

1. Cool drinking water should be provided.

2. If possible, the dressing rooms should be air-conditioned. If air conditioning is not possible, dressing rooms should have extractor fans to reduce humidity.

3. The distance from the dressing rooms to the rest rooms should be kept to a minimum.

4. The total number of washrooms should be at least that specified by the current edition of the Ontario Building Code. Washrooms should be cleaned and maintained regularly. Where suitable water is not available for wash-up, an alcohol-based hand cleaner shall be made available.

5. If possible, showers should be provided.

6. A telephone or cell phone should be available to the designated on-site health and safety officer.

7. A first aid area should be provided with a first aid kit, cot, and a quiet, shaded protected area for resting.

8. The first aid equipment should include cold and heat packs.

CONCERT PERFORMANCES

1. All stage areas should be stable and level.

2. Musicians should be seated on a stage, risers or equivalent structure.

3. Measures should be taken to prevent chairs and other equipment from tipping or running off the edge. Musicians should not be seated directly on unsupported plywood sheets, grass, dirt, straw, gravel, or other non-stage surface.

4. Entrance/exit stairs to and from any performance platform must have a handrail and be wide enough for musicians to carry their instruments.

5. Lighting at adequate reading level should be provided. In the event that the existing overhead light may fall below reading level, two 40-watt stand lights (or the equivalent) should be made available, upon request, to those musicians affected. Lighting for safe passage to and from the stage should be provided.

6. The producer should provide non-collapsible music stands and microphone stands in good condition and sandbags to anchor the stands in case of gusting winds.

7. The producer should provide proper, stable seating for each performing musician in the form of a well-maintained chair of medium to low height with a flat back and a level seat.

8. Sound shields should be stabilized and secured in case of gusting winds.

VENUE SECURITY

1. The backstage area, including dressing rooms and toilet facilities – and the routes between these areas and the performance space – should be secured from public access. Where this is not possible, a buddy system should be implemented.

2. The company should have a procedure to deal with intruders. No one should work in isolation. Ensure that there are at least two workers in all parts of the site.

3. Adequate lighting, or portable lighting implements, should be available backstage.

ANIMALS (from the Safety Guidelines for Film and Television)

1. Only designated performers or professional trainers should be permitted to work with animals.

2. Anyone not directly involved in the activity with the animals should not distract the animals.

3. The trainer or person supplying the animal(s) shall be responsible for obtaining all necessary inoculations, permits, applicable licenses and medical safeguards.

4. An easily accessible area shall be available for loading and unloading animals.

5. An opportunity shall be given to the trainer to address the workers (including the parents or guardians of any children in the production) about safety precautions while animals are present.

6. Tranquilization or sedation of performing animals should be accomplished only where circumstances warrant upon advice of the trainer and a qualified veterinarian.

7. Horses should be properly shod for the working surface.

8. The trainer shall ensure that all animals required to work in an outdoor "theatrical" venue are well prepared for such situations.

VEHICLES

1. Any vehicles or motorized equipment used in performance must have a qualified driver or operator.

2. Ground over which the vehicle or motorized equipment is to be driven should be checked for obstructions.

3. The vehicle or motorized equipment should be taken for a trial run to test the ground, particularly after a rainfall.

4. The driver/operator should adjust the speed of the vehicle to reflect the ground conditions.

5. There should be adequate rehearsal time for any stunts, such as jumping from a stationary or moving vehicle.

RESOURCES

Websites that have information on Humidex, Weather Reports and Smog Alerts:

Environment Canada
http://www.msc.ec.gc.ca/
Environment Canada Fact Sheet: Summer Severe Weather
http://www.on.ec.gc.ca/severe-weather/summer.html
Environment Canada Humidex Calculator
http://lavoieverte.qc.ec.gc.ca/meteo/Documentation/Humidex_e.html
Environment Canada Weather Office
http://www.weatheroffice.ec.gc.ca/canada_e.html
Air Quality Ontario Smog Advisories
http://www.airqualityontario.com/

Additional information on methods to monitor and manage workplace heat exposures:
Construction Safety Association of Toronto
http://www.csao.org/uploadfiles/magazine/vol11no2/heat.htm
http://www.csao.org/images/pfiles/251_heatstress-datasheet.pdf

The Canadian Centre for Occupational Health and Safety
http://www.ccohs.ca/oshanswers/phys_agents/heat_control.html
http://www.ccohs.ca/oshanswers/phys_agents/heat_health.html
http://www.ccohs.ca/oshanswers/phys_agents/hot_cold.html
http://www.ccohs.ca/oshanswers/phys_agents/humidex.html

City of Toronto
http://www.city.toronto.on.ca/health/beatheat.htm

U.S. Occupational Safety and Health Administration (OSHA)
http://www.osha.gov/SLTC/heatstress/
http://www.osha.gov/Publications/osha3154.pdf

The following website has information on water inspection:
The Ministry of the Environment
http://www.ene.gov.on.ca/water.htm

Also see:
Workplace Safety Insurance Board (WSIB)
http://www.wsib.on.ca

Ontario Ministry of Labour
http://www.labour.gov.on.ca/english/index.html
Information on West Nile virus
http://www.labour.gov.on.ca/english/hs/ua_wnv_faq.html

Website addresses may change. These links are accurate as of August 2005.

Links to external websites are offered for the convenience of users in accessing related information. These links do not constitute an endorsement of the websites or their contents. The Ministry of Labour takes no responsibility for the views, contents or accuracy of the information presented by an external website.

APPENDICES

Electrical Safety Authority

BULLETIN | **2-7-17**

November 2004

Supersedes Bulletin 2-7-16 May 2004

Approval of Electrical Equipment

Rule 2-024

The Ontario Electrical Safety Code recognizes certification organizations accredited by the Standards Council of Canada to approve electrical equipment. Only equipment bearing one of the marks or labels shown in the drawings is approved.

Equipment to meet the requirements of the Ontario Electrical Safety Code must be approved to Canadian standards. This is signified by the "C" outside the Entela, ETL, MET, OMNI, QAI, TUV America, TUV Rheinland and UL marks. The "NRTL/C" shown with one Canadian Standards Association mark, and the "cULus" shown with one Underwriters Laboratories mark, indicate the equipment with those marks is also compliant with United States standards.

A Canadian Standards Association mark with "NRTL" only, and Underwriters Laboratories mark without the "c" at the eight o'clock position, indicates the equipment is compliant with United States standards.

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CERTIFICATION MARKS ACCEPTABLE UNDER THE ELECTRICAL SAFETY CODE

Canadian Standards Association (CSA)				
Entela				
Intertek Testing Services				
Met Laboratories Inc. (MET)				
OMNI Environmental Services Inc.				
Quality Auditing Institute				
TUV America				
TUV Rheinland				
Underwriters Laboratories Inc. (UL)				
Underwriters' Laboratories of Canada (ULC)				

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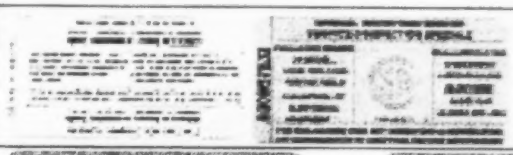
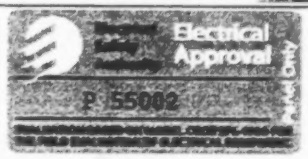
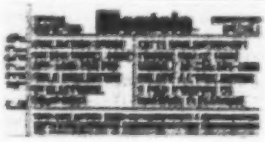
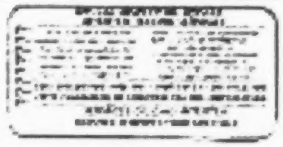
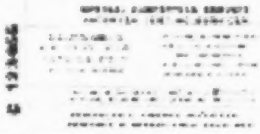
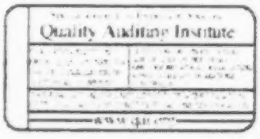
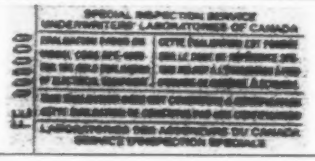
November 2004 Supersedes Bulletin 2-7-16 May 2004

FIELD EVALUATION MARKS ACCEPTABLE UNDER THE ELECTRICAL SAFETY CODE

CANADIAN STANDARDS ASSOCIATION (CSA)	
ELECTRICAL SAFETY AUTHORITY (ESA)	 **See Note
ENTELA	 ** See Note
INTERTEK TESTING SERVICES	 
ONTARIO HYDRO (OH)	
QUALITY AUDITING INSTITUTE (QAI)	
TUV RHEINLAND (TUV)	
UNDERWRITERS LABORATORIES OF CANADA (ULC)	

** NOTE - " PANEL ONLY" label identifies that the panel has been evaluated to the SPE-1000. It does not cover equipment that is added or connected to the panel.

Component Marks Acceptable under the Electrical Safety Code which are specifically

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ed on component parts that are part of a larger product or system

Canadian Standard Association (CSA)

Underwriters Laboratories Inc. (UL)

Note: Electrical components bearing these marks may have restrictions on their performance or may be incomplete in construction, and are intended to be used as part of a larger approved product or system. The Component Recognition marking is found on a wide range of products, including some switches, power supplies, printed wiring boards, some kinds of industrial control equipment and thousands of other products.

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Certification Organization	Contact Information
CANADIAN STANDARDS ASSOCIATION (CSA)	Phone Number: 416-520-6442 E-mail: specialinspection@csa-international.org or jim.robinson@csa-international.org Web address: www.csa-international.org
ELECTRICAL SAFETY AUTHORITY (ESA)	Phone Number: 613-271-1489 or 1-800-559-5356 Fax Number: 613-271-6441 or 1-800-559-5358 E-mail: field.evaluation@electricalsafety.on.ca Web address: www.esapa.biz
ENTELA	Phone Number: 416-241-8427 or 1-877-746-4777 E-mail: info@entela.com Web Address: www.qps.ca
INTERTEK TESTING SERVICES	Phone Number: 905-678-7820 Fax Number: 905-678-7131 E-mail: wkole@etlsemko.com Web Address: www.etlsemko.com
QUALITY AUDITING INSTITUTE (QAI)	Phone Number: 416-707-1343 E-mail: sharris@qai.org Web Address: www.qai.org
TUV AMERICA	Phone Number : 978-739-7021 E-Mail: gminks@tuvam.com Web Address: www.TUVamerica.com
TUV RHEINLAND (TUV)	Phone Number: 416-733-3677 Fax Number: 416-733-7781 E-Mail: skraemer@us.tuv.com Web Address: www.us.tuv.com
UNDERWRITERS LABORATORIES OF CANADA (ULC)	Phone Number: 1-866-9373 x 852 Fax Number: 416-757-8727 E-Mail: customerservice@ulc.ca Web Address: www.ulc.ca

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APPENDIX B: REQUIREMENTS FOR ELECTRICAL DISTRIBUTION BOXES

November 2004

TABLE 1

BOX #	PHASE	SUPPLY	LINE CONNECTOR	LOAD CONNECTOR	BREAKER(S)
1	3	120/208v	cam-lok*	cam-lok*	400 Amp 3 pole
2	Single 1	120/208v	cam-lok*	140A 4 pin Joy**	2: 100 A 2 pole
3	Single 1	120/208v	cam-lok*	140A 4 pin Joy**	1: 100 A 2 pole
3A	3	120/208v	cam-lok*	140A 4 pin Joy**	3: 100 A 2 pole
2A	Single 1	120/208v	125A 4 pin Joy**	60A 4 pin Joy***	1: 60 A 2 pole
9	Single 1	120/208v	cam-lok*	60A 4 pin Joy***	1: 60 A 2 pole
	3	120/208v	cam-lok*	cam-lok*	250 A 3 pole
	3	120/208v	cam-lok*	cam-lok*	200 A 3 pole
	3	120/208v	cam-lok*	cam-lok*	175 A 3 pole
	3	120/208v	cam-lok*	cam-lok*	100 A 3 pole
	3	120/208v	cam-lok*	cam-lok*	100 A 3 pole
Tee-Tower	3	120/208v	cam-lok*	cam-lok*	NONE
Crowfoot	3	120/208v	cam-lok*	cam-lok*	NONE

* "CAM-LOK" TM - Trade name which has become generic; moulded water resistant SINGLE PIN connector

** 140A round moulded water resistant connector (TV Mobile)

*** "Joy" TM - Trade name which has become generic; moulded water resistant hard usage connectors

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TABLE 1A

BOX #	PHASE	SUPPLY	LINE CONNECTOR	LOAD CONNECTOR	BREAKER(S)	NOTE
4	Single 1	120/240v	cam-lok	60 A 3 pin Joy***	4: 60 A 1 pole	May be 6 circuit
4A	3	120/240v	cam-lok	60 A 3 pin Joy***	6: 60 A 1 pole	
4AW	3	120/240v	cam-lok	60 A 3 pin Joy***	6: 60 A 1 pole	Weatherproof
5	Single 1	120/240v	cam-lok	60 A 4 pin Joy***	2: 60 A 2 pole	
5A	3	120/240v	cam-lok	60 A 4 pin Joy***	3: 60 A 2 pole	
6A	Single 1	120/240v	4 pin Joy***	15A HOSPITAL GRADE type 5-15	6: 20 A 1 pole	Per 66-400 (5)
"Load Centre"	Single 1	120/240v	cam-lok	15A HOSPITAL GRADE type 5-15	8: 20 A 1 pole	Per 66-400 (5)
7	Single 1	120/240v	4 pin Joy***	60 A 3 pin Joy***	2: 60 A 1 pole	
	Single 1	120/240v	4 pin Joy***	14-50	50 A 2 pole	Stove or equipment with 14-50 connector
8A (3x20)	Single 2w + grd	120v	3 pin Joy***	15A HOSPITAL GRADE type 5-15	3: 20 A 1 pole	Per 66-400 (5)
	Single 2w + grd	120v	3 pin Joy***	15A HOSPITAL GRADE type 5-15	3: 20 A 1 pole GFCI	GFCI
	Single 2w + grd	120v	3 pin Joy***	60 A 3 pin Joy***	1: 60 A 1 pole GFCI	GFCI
	Single	120/240v	4 pin Joy***	60 A 3 pin Joy***	2: 60 A 1 pole GFCI	GFCI
RV	Single 2w + grd	120v	3 pin Joy***	RV receptacle (Non-NEMA)	30 A 1 pole	For equipment with non-NEMA RV connectors
10	3	120/208v	cam-lok	cam-lok	3: 100 A 1 pole	10k incandescent

1 "Single" - means single phase, 3 wire plus ground

*** Joy" TM - Trade name which has become generic; moulded water resistant hard usage connectors

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THE COMMITTEE

CURRENT MEMBERS
As of July 2005

Bonnie Armstrong
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Ken Chan
Neil Dennison
David Feheley
Tim Jennings
Kim Litchfield
Doug McBoyle
Peter McKinnon
Tom McLean
Brandon Moore
Stephen Mosher
Miriam Newhouse
Janet Sellery
Allan Teichman
Brad Turner
Peter Urbanek
John Watson

Don Brown (MOL Advisor)

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Andrea Lundy
Allan Macmillan
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Hugh Neilson
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Sandy Robinson
Jim Roe
Kevin Ryan
Paul Shaw
Julian Sleath
Shirley Third
David R. Thornton
Martin Zwicker

Colin Wilson, MOL Advisor
Arupa Tesolin (formerly Linda Tesolin) MOL Advisor

The following companies and associations are/were represented on the committee:

American Federation of Musicians of the United States and Canada
Associated Designers of Canada
Canadian Actors' Equity Association
Community Cultural Impresarios
Canadian Institute for Theatre Technology
Canadian Opera Company
Canadian Union of Public Employees
International Alliance of Theatrical Stage Employees
Mirvish Productions
National Ballet School of Canada
Paramount Parks
Professional Association of Canadian Theatres
Shaw Festival
Sky Dome/Rogers Centre
Stratford Festival
Theatre Ontario
Toronto Theatre Alliance

ACKNOWLEDGMENTS

The Ontario Advisory Committee for Health and Safety in Live Performance is made up of professionals in live performance from across the province - large and small, commercial and not-for-profit, service organizations and professional associations. We have had input from individual experts both national and international. The Advisory Committee and the Ministry of Labour would like to thank the following people for their help in making these guidelines possible:

* Indicates a main committee member at the time the sub-committee was active.

ELECTRICAL

Bonnie Armstrong*	
Rick Boychuk	Theatre Safety Consultants
Ron Foley	SCENEWORK
Jim McManamy	Ryerson Theatre
Nigel Romeril	IATSE 58
Karl Wylie	Centre in the Square
Bob Stewart	Senior Electrical Inspector, Electrical Safety Authority

FOG AND SMOKE

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Rick Boychuk*
Rob Gunn*
Peter McKinnon*
Steve Mosher*
Bob Nicholson
Shirley Third*

HAND PROPS AND COSTUMES

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Marjorie Fielding	Wardrobe Supervisor, National Ballet of Canada
John Peter Jeffries*	
Shawn Kerwin	Designer
Grace Nakatsu*	
Miriam Newhouse*	
Phillip Silver	Professor of Design, York University
Stephanie Tjelios	Props, Canadian Opera Company

ORCHESTRA PITS

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Cathryn Gregor	Canadian Opera Company
Chuck Homewood*	
Peter Lamb	LivEnt
Allan Macmillan*	
Stephen Mosher	Toronto Musicians' Association
Sharon Poitras*	
Nigel Romeril	National Ballet Company

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Don Finlayson	Production Manager, CanStage
Anthony Leo	Resurgence Theatre
Larissa Mair	Theatre by the Bay
Steve Mosher*	
Hugh Neilson*	
Miriam Newhouse*	
Sharon Poitras	PACT
Paul Shaw	Producer, CanStage
Megan Somerville	Stage Manager
Lee Wilson	Resurgence Theatre

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Ron A. Epp*	
Miriam Newhouse*	
John Stead	Fight/Stunt Co-ordinator

PYROTECHNIC SPECIAL EFFECTS

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David Pier	MP Associates, CA
Mark Rice	Stage FX
Eric Tucker	PPA, St. Louis
Dave McCulloch	Federal Dept. of Natural Resources
Ted Scovel	Chief, Toronto Fire Department
Larry Wheatley	Sergeant, ETF Bomb Squad, Toronto Police Dept.

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Robert Cannon	Chiropractor
Ron A. Epp*	
John Peter Jeffries*	
Cheryl Lany*	
Peter McKinnon*	
Winston Morgan*	
Steve Mosher*	
Dean Ott	CanStage
Jennifer Walker	

RIGGING SYSTEMS AND FALL ARREST

Bonnie Armstrong*	
Ron A. Epp	IATSE, Local 461
Stan Fernandez	Engineer, Ministry of Labour
Victor Svenningson	Manager, Technical Services, Harbourfront

SOUND LEVELS

Marshall Chasin	M.Sc., Reg. OSLA, Aud(C), Audiologist
Shree Jha	P.Eng., C.I.H., R.O.H., Provincial Hygienist
Rod Karpel	Audio Engineer, IATSE, Local 58
David Leong	PhD., P.Eng., C.I.H., R.O.H., Provincial Hygienist
Steve Mosher*	
John Percy	Stage Manager, Firearms Specialist

STAGE COMBAT AND WEAPONRY

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James Brewer	Fight Director
Robert Cannon	Chiropractor
David Drum	Chiropractor
Mark Erwin	Chiropractor
F. Braun McAsh	Fight Director
John Nelles	Fight Director
Miram Newhouse*	
Martin Zwicker	

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COMMUNICATIONS (Past)

James Camrite*
Jane Gardner*

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Katrina Baran*	
Miriam Newhouse*	
Peter Messaline	Writer/Actor

EDITORIAL (Past)

Syme Jago*	
John Peter Jeffries*	
Peter Messaline	Writer/Actor
Miriam Newhouse*	
Sharon Poitras*	

We would like to thank the Section 21 Advisory Committee on Health and Safety in the Ontario Film and Television Industry for their pioneering work in developing safety procedures in the entertainment industry.

ORGANIZATIONS AND ASSOCIATIONS

Department of Natural Resources
(Contact: Dave McCulloch)
Explosives Branch
580 Booth Street,
Ottawa, Ontario
K1A 0E4

Tel: (613) 948-5200
Fax: (613) 948-5195

Fight Directors, Canada
(Contact: John Nelles)
97 Trinity Street, #1
Toronto, Ontario
M5A 3C7

Tel: (416) 861-1016
email: jnelles@fdc.ca

Fire Prevention Department
(Contact: Chief Ted Scovel)
New City Hall
100 Queen Street West
Toronto, Ontario
M5H 2N2

Tel: (416) 338-9350

PUBLICATIONS

The Advisory Committee urges workers and management to read the following reference material:

GENERAL

1. A Guide to the Occupational Health and Safety Act
2. Occupational Health and Safety Act (1990)
3. Regulations for Industrial Establishments
4. Workplace Hazardous Materials Information Systems (WHMIS): A Guide
5. Workers' Compensation Board Handbook

Ontario Ministry of Labour
Publications Section
655 Bay Street, 14th Floor
Toronto, Ontario M7A 1T7
Tel: (416) 326-7731 / (800) 268-8013 Fax: (416) 326-7745

PYROTECHNIC SPECIAL EFFECTS

1. Alberta Section, CITT, Pyro Standards

   Canadian Institute for Theatre Technology (CITT
   2500 University Drive NW
   Calgary, Alberta T2N 1N4

2. Federal Regulations for Explosives Class 7.2.5

   Natural Resources Canada
   Explosives Branch
   580 Booth Street, 15th Floor
   Ottawa, Ontario K1A 0E4

3. Filming in California (replaces the Film Industry Fire/Life Safety Handbook)

   California State Fire Marshal
   PO Box 944246
   Sacramento, California 94244-2460 USA
   Tel: (310) 217-6927

4. National Fire Prevention Association Code 1126
(Standard for the Use of Pyrotechnics)

c/o Canadian Association of Fire Chiefs
Tel: (613) 270-9138 Fax: (613) 599-7027

RIGGING AND FALL ARREST

1. Regulations for Construction Projects
2. Regulations for Window Cleaning

Ontario Ministry of Labour
Publications Section
655 Bay Street, 14th Floor
Toronto, Ontario M7A 1T7
Tel: (416) 326-7731 / (800) 268-8013
Fax: (416) 326-7745

SOUND LEVELS

1. Medical Problems of Performing Artists, Volume 7, Number 2, June 1992, "Sound Exposure During Performance of Wagner's Ring Cycle", Camp, J. & Horsman, S., pages 37-39
"A Clinically Efficient Hearing Protection Program for Musicians", Chasin, M. & Chong, J., pages 40-43

Musicians' Clinics of Canada
545 Sanitorium Rd Ste 205
Hamilton, Ontario L9C 7N4
Tel: (905) 574-5444

Toronto Office
340 College St Ste 440
Toronto, Ontario M5T 3A9
Tel: (416) 966-8742

2. OSHA Federal Register 48 (46) (1983)
"Occupational Noise Exposure and Hearing Conservation Amendment", pages 738-739, 783

Occupational Safety and Health Administration
Office of Science and Technology Assessment
200 Constitution Ave N.W. Room N3655
Washington, D.C. 20210 U.S.A.
Tel: (202) 693-2095

3. Canadian Family Physician, Volume 39, May 1993
"Risks to Hearing from Rock Concerts",
Yassi, Pollock, Tran and Cheang, pages 10-46

College of Family Physician of Canada
2630 Skymark Avenue
Mississauga, Ontario
L4W 5A4
Tel: (905) 629-0900

REQUEST FORM

For additional copies of the Live Performance Safety Guidelines please complete the following form and mail or fax it to:

ONTARIO MINISTRY OF LABOUR
PUBLICATIONS SECTION
655 BAY STREET, 14TH FLOOR
TORONTO, ONTARIO
M7A 1T7

FAX: (416) 326-7745
EMAIL: mol.publications@mol.gov.on.ca

Name: .....

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